RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily, Ovid MEDLINE and Versions(R)

Search Strategy:

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1  exp *maxillofacial injuries/ or exp *tooth injuries/ (19135)
2  (tooth and (fractur$ or injur$ or avuls$ or replant$)).ti. (1019)
3  ((jaw or maxillofacial or maxilla$ or mandibular$) and (injur$ or fractur$)).ti. (5535)
4  1 or 2 or 3 (20695)
5  limit 4 to english language (14242)
6  limit 5 to ("review" or systematic reviews) (1127)
7  review.ti. and 5 (426)
8  6 or 7 (1281)
9  limit 8 to dentistry journals (793)
10  (dentist$ or dental$).tw. (234935)
11  8 and 10 (351)
12  9 or 11 (863)
13  exp Orbital Fractures/ (3088)
14  (orbital adj2 fracture$).tw. (2121)
15  13 or 14 (3861)
16  maxillofacial.tw. (16298)
17  15 not 16 (801)
18  19 exp animals/ not humans/ (4589760)
19  18 not 19 (3554)
20  limit 20 to yr="2015-Current" (85)
21  remove duplicates from 21 (75)

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27862983
VI 1
Status
In-Process
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Title
Denosumab: Prevention and management of hypocalcemia, osteonecrosis of the jaw and atypical fractures. [Review]
Source
Abstract
Denosumab, a bone-modifying agent, reduces the risk of skeletal-related events in patients with bone metastases from solid tumors and is generally well tolerated. However, hypocalcemia, osteonecrosis of the jaw (ONJ) and atypical fracture are potential and important toxicities of denosumab therapy that require attention. In pivotal phase III trials in patients with bone metastases from solid tumors, the incidence of hypocalcemia was 9.6% in denosumab-treated patients, with most events being asymptomatic, grade 2 and resolving by week 4. Established hypocalcaemia requires additional short-term calcium and vitamin D supplementation and, if severe, administration of intravenous calcium. ONJ was reported in 1.8% of patients receiving denosumab over 3 years in these trials. Involvement of an experienced oro-maxillary surgeon is important if ONJ is suspected. Atypical fractures were rare in a large study of denosumab using the dose and scheduling approved for the treatment of osteoporosis. To prevent toxicities, patients should maintain calcium and vitamin D supplementation, good oral hygiene and regular dental reviews throughout treatment. This article presents case studies from our clinical practice and discusses the pathophysiology of these toxicities along with guidance on prevention, diagnosis and management.

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Status
PURPOSE: Third molars (M3s) have been hypothesized to be associated with the risk of mandibular angle fracture and mandibular condylar fracture. The authors systematically estimated the relative risk (RR) of M3 status for the development of mandibular angle fracture and mandibular condylar fracture through a meta-analysis of cohort studies.

MATERIALS AND METHODS: In this systematic review, the PubMed, EMBASE, and Cochrane Library databases were searched from inception to October 2016. The predictor of risk was the presence or absence of M3s. The primary outcome was the RR of mandibular angle or condylar fracture. A fixed- or a random-effects model was applied to evaluate the pooled risk.
estimates. Sensitivity analysis also was performed to identify the potential sources of heterogeneity. Publication bias was assessed by the Begg and Egger tests.

RESULTS: Overall, 13 retrospective cohort studies were included. Of these, 13 reported the association between M3s and mandibular angle fracture, and 5 reported the association with mandibular condylar fracture. Patients with M3s had an increased risk of mandibular angle fractures (RR = 2.63; 95% confidence interval [CI], 2.15-3.21) but a decreased risk of mandibular condylar fractures (RR = 0.47; 95% CI, 0.25-0.86). Substantial heterogeneity in the risk estimates was found. No evidence of publication bias was found.

CONCLUSION: The present meta-analysis provides further evidence associating the presence of M3s with an increased risk of mandibular angle fractures and a simultaneously decreased risk of mandibular condylar fracture. Because of potentially more serious complications associated with condylar fracture, clinicians should carefully consider the decision to remove M3s to decrease the risk of mandibular angle fracture.

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Purpose: The aim of this study was to determine the feasibility of direct transcortical stabilization of fracture dislocations of the mandibular condyle (FDMCs) using narrow-diameter non-threaded Kirschner wire (K-wire).

Materials and Methods: This retrospective review reports on the treatment outcomes for 12 patients (15 fractures) with FDMCs treated with open reduction using transcortical 0.027-inch K-wire stabilization. Postoperative parameters of relevance included infection, facial nerve function, hardware removal, mandibular range of motion, and radiographic determination of fracture union.

Results: Three patients had bilateral FDMCs and 9 had unilateral FDMCs (age range at time of injury, 14 to 72 yr; mean age, 32 yr). Postoperative follow-up ranged from 6 weeks to 2 years. Four patients required removal of K-wire hardware for different reasons. K-wires were removed because of infection in 1 patient. Another patient required removal because of migration of the pin into the joint space. One pin was removed electively and another was removed for nonspecific postoperative symptoms that resolved after pin removal. Persistent facial nerve deficit was observed in 1 patient.

Conclusion: Open reduction with transcortical K-wire stabilization can achieve satisfactory outcomes for the treatment of FDMC. Further investigation is needed in determining the efficacy of this fixation technique in the management of FDMC.
Dental and Orofacial Injuries. [Review]


Abstract
Oral and facial injuries are very common in sport, and can be very expensive to treat. Many of these injuries are preventable with proper pre-competition assessment and suitable well-designed protection. Prompt sideline identification and management of orofacial injuries and appropriate follow-up are crucial to successful outcomes. There have been significant recent advances in both trauma management and mouth guard design and fabrication techniques. Athletes have a unique set of challenges-including collisions, finances, travel and training, dehydration, sport beverages, and high carbohydrate diets-that may compromise their oral health.

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Purpose: The purpose of our study was to investigate whether the occurrence of preoperative diplopia determines the incidence of postoperative diplopia after repair of orbital floor fracture.

Materials and Methods: We undertook a retrospective cohort study with a review of the records of 126 consecutive patients who had undergone repair of an orbital floor fracture under the maxillofacial surgery service at John Hunter Hospital (Newcastle, NSW, Australia). The primary predictor variables were a number of demographic, etiologic, and operative factors that might influence the occurrence of diplopia. The secondary outcome variable was diplopia. A descriptive statistical analysis was used to assess each of these variables and their potential relationship to the occurrence of diplopia.

Results: Of the 126 patients included in our study, 84 (66.6%) were treated for diplopia and 42 (33.3%) for dystopia. We found that orbital exploration and repair, when undertaken to manage diplopia, can resolve (75%), improve (7.14%), stabilize (7.14%), or worsen (10.71%) diplopia. In contrast, orbital surgery to manage or prevent dystopia can, in our experience, induce diplopia in 9.52% of patients. At the 95% confidence interval, age was the only variable shown to be significantly associated with diplopia (P = .039). We found that the presence of preoperative diplopia is causally statistically associated with postoperative diplopia at the 90% confidence interval (P = .063).

Conclusions: Diplopia is a common occurrence that results from orbital floor fracture. It can resolve, persist (improve, remain stable, or worsen), or be induced after repair of such an injury. In addition to the known myogenic cause (entrapment) of diplopia,
both trauma and surgical manipulation have been shown to have the capacity to compromise oculomotor nerve function and possibly result in the development of neurogenic causes of diplopia. It has also been noted that several intraorbital adherence syndromes can potentially contribute to the development of diplopia. This is an area that requires further research.

PURPOSE: The purpose of the present systematic review was to assess the added value of panoramic radiography in predicting postoperative injury of the inferior alveolar nerve (IAN) in the decision-making before mandibular third molar (MM3) surgery.

MATERIALS AND METHODS: MEDLINE and EMBASE were searched electronically to identify the diagnostic accuracy of studies that had assessed the predictive value of 7 panoramic radiographic signs, including root-related signs (darkening of the root, deflection of the root, narrowing of the root, and dark and bifid apex of the root) and canal-related signs (interruption of the white line of the canal, diversion of the canal, and narrowing of the canal) for IAN injury after MM3 surgery.

RESULTS: A total of 8 studies qualified for the meta-analysis. The pooled sensitivity and specificity of the 7 signs ranged from 0.06 to 0.49 and 0.81 to 0.97, respectively. The area under the summary area under the receiver operating characteristic curve ranged from 0.42 to 0.89. The pooled positive predictive value (PPV) and negative predictive value (NPV) ranged from 7.5 to 26.6% and 95.9 to 97.7%, respectively. The added value of a positive sign for ruling in an IAN injury (PPV minus the prior probability) ranged from 3.4 to 22.2%. The added value of a negative sign for ruling out an IAN injury (NPV minus [1 minus the prior probability]) ranged from 0.1 to 2.2%.

CONCLUSIONS: For all 7 signs, the added value of panoramic radiography is too low to consider it appropriate for ruling out postoperative IAN injury in the decision-making before MM3 surgery. The added value of panoramic radiography for determining the presence of diversion of the canal, interruption of the white line of the canal, and darkening of the root can be considered sufficient for ruling in the risk of postoperative IAN injury in the decision-making before MM3 surgery.
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Title Intermaxillary fixation screws versus Erich arch bars in mandibular fractures: A comparative study and review of literature.
Abstract OBJECTIVE: Various techniques have been employed from time to time to achieve maxillomandibular fixation. Although arch bars provide an effective and versatile means of maxillomandibular fixation, their use is not without shortcomings. However the introduction of intermaxillary fixation screws (IMF) has eliminated many of these issues of arch bars. The aim of the present study was to compare the advantages and disadvantages of intermaxillary fixation screws over the Erich arch bars in mandibular fractures.
MATERIALS AND METHODS: Sixty dentulous patients who reported to Department of Oral and Maxillofacial Surgery, Al-Ameen Dental College and Hospital, Bijapur with mandibular fractures and required intermaxillary fixation as a part of treatment plan followed by open reduction and internal fixation under GA were selected and randomly divided into 2 groups of 30 patients each that is Group A and Group B. Group A included patients who received intermaxillary fixation with Erich arch bars. Group B includes patients who received intermaxillary fixation with IMF Screws. The parameters compared in both the groups included, surgical time taken, gloves perforation, post-operative occlusion, IMF stability, oral hygiene, patient acceptance and comfort and non-vitality characteristics.
RESULTS: The average surgical time taken and gloves perforations were more in Group A, the patient acceptance and oral hygiene was better in Group B, there was not much statistically significant difference in postoperative occlusion and IMF stability in both groups. Accidental root perforation was the only limitation of IMF screws.
CONCLUSION: Intermaxillary fixation with IMF screws is more efficacious compared to Erich arch bars in the treatment of mandibular fractures.
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Title Damage control surgery and combat-related maxillofacial and cervical injuries: a systematic review. [Review]
Abstract Damage control surgery involves rapid assessment, life-saving resuscitation, and abbreviated surgery for a patient with severe injuries. Traditionally the concept of damage control surgery has been restricted to penetrating abdominal injuries, but more recently it has been expanded to areas outside of the abdomen including the maxillofacial and neck regions. However, we know of little evidence that, when applied to injuries to the face and neck, it changes outcomes. We systematically reviewed published papers to identify those that discussed damage control in the context of combat-related trauma of the face and neck. We identified three papers that discussed the principles of managing combat-related maxillofacial injuries, all three of which were review articles.
that advocated the use of damage control principles in facial injuries either in isolation or as part of a multisystem approach. Anecdotal experience and opinion indicates that the concept of damage control is applicable when managing combat-related injuries of the face and neck, but no outcomes were confirmed. Further studies are required to validate the concept.

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Abstract
INTRODUCTION: This study aimed to report a possible effect of the presence of an adjacent implant on the development of a vertical root fracture (VRF) in endodontically treated teeth. METHODS: A series of 8 cases in 7 patients with teeth diagnosed with VRF after the placement of implants in the adjacent area is described and analyzed. In addition, a comprehensive literature search with strict inclusion and exclusion criteria was undertaken to identify additional clinical studies that assessed this clinical scenario. RESULTS: The case series analysis revealed that the time from implant placement to the diagnosis of VRF was between 5 and 28 months (average = 11 months). The majority of cases occurred in female patients who received 2 or more implants. Six of the 7 patients were older than 40 years, with an average age of 54 years. The majority of teeth with VRF were premolar or mandibular molar teeth (6/8 teeth). All fractured teeth had been restored with a crown and had a post present, and the quality of the root canal filling was determined to be adequate. The systematic review revealed that implant-associated VRF has not been investigated or reported in the literature yet. CONCLUSIONS: Based on a systematic review of the literature, this case series, although limited in its extent, is the first clinical report of a possible serious adverse event of implant-associated VRF in adjacent endodontically treated teeth. Additional clinical studies are indicated to shed light on this potential phenomenon.

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NEW REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

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Title
Multiple mandibular fractures. Treatment outlines. [Review]

Source

Abstract
Multiple mandibular comminuted fractures usually occur in high energy traumas. The authors describe the management and treatment of multiple mandibular fractures in a young patient after a suicide attempt.

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Title
Decision Making for Retention of Endodontically Treated Posterior Cracked Teeth: A 5-year Follow-up Study.

METHODS: Two hundred patients who had root canal-treated posterior cracked teeth at the National Dental Centre were recalled for a 5-year review. Eighty-four patients who met the inclusion criteria were included in this study. The cases were managed following the treatment protocol for cracked teeth at the center. The data for analyses were obtained from the patients' clinical records. Statistical analyses were performed using SPSS 21.0 (SPSS Inc, Chicago, IL). The outcome measure was the presence of tooth at the time of the review.

RESULTS: At 5 years, 77 teeth "survived" (92%), and 7 teeth (8 %) were extracted. Patient demographics, tooth type and location, existing restoration, number and location of cracks, presence of pretreatment signs and symptoms, and initial pulpal and periapical diagnosis did not significantly affect the survival of the teeth. Univariate analysis showed that teeth with extension of the cracks onto the pulpal floor were more often extracted (odds ratio = 4.5, P = .07). Multivariable analyses found that extension of cracks onto the pulpal floor independently increased the odds of tooth loss by 11-fold (odds ratio = 11, P = .033), with other factors being held constant. The 5-year survival estimate in the absence and presence of crack extension onto the pulpal floor was 99% and 88%, respectively.

CONCLUSIONS: Coronal cracks may be predictably treated, whereas radicular cracks increased the odds of the tooth being extracted.

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INTRODUCTION: A vertical root fracture (VRF), commonly found in teeth with endodontic treatment, is challenging to diagnose and has poor treatment outcomes. Cone-beam computed tomography (CBCT) has become an increasingly popular imaging modality in endodontology, but image artifacts arising from root-filling materials may hinder VRF detection. The aim of this investigation was to conduct a systematic review to assess the diagnostic ability of CBCT for detecting VRFs in endodontically treated teeth.

METHODS: A systematic review of in vivo clinical diagnostic literature (initial search December 2014, updated August 2015) was conducted. Assessment of methodological quality was performed by using the modified Quality Assessment of Diagnostic Accuracy Studies tool.

RESULTS: Four studies with a total of 130 patients were included. The reported ranges of values were 40%-90% for VRF prevalence, 84% (0.64-0.95) to 100% (0.83-1.00) for sensitivity, 64% (0.35-0.87) to 100% (0.03-1.00) for specificity, 71% (0.51-0.87) to 100% (0.63-1.00) for positive predictive value, and 50% (0.01-0.99) to 100% (0.84-1.00) for negative predictive value. All 4 studies revealed multiple items at high risk or unclear risk of bias.

CONCLUSIONS: Because of the significant imprecision in the range of reported estimates and the biases observed in the included studies, there is currently insufficient evidence to suggest that CBCT is a reliable test in detecting VRFs in endodontically treated teeth.

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A single-center retrospective review of postoperative infectious complications in the surgical management of mandibular fractures: Postoperative antibiotics add no benefit.

**Source**

**Abstract**
BACKGROUND: Mandibular fractures are common facial injuries and treatment may be complicated by post-operative infection. Risk of infection from contamination with oral flora is well established but no consensus exists regarding antibiotic prophylaxis. The purpose of this study is to assess risk factors and perioperative antibiotics on surgical site infection (SSI) rates following mandibular fracture surgery.

METHODS: Retrospective medical record review was completed for trauma patients of any age surgically treated for mandibular fractures at a Level I Trauma Center from September 2006 to June 2012. Outcomes analysis was performed to determine SSI rates related to perioperative antibiotic use and other risk factors that may contribute to SSI.

RESULTS: 359 patients met inclusion criteria for analysis. 76% were male. Mean age was 30.5 years. Thirty-eight patients developed SSI (10.6%). SSI rate was lower in closed versus open surgery (3.2% vs. 16.3%, p=0.0001), and in closed versus open fractures (1% vs. 14%, p=0.0005). SSI rate increased in patients with tobacco, alcohol, and drug use (14.6%, 13.2%, 53.6%, p<0.0001), traumatic dental injuries (19.6%, p=0.0110), and patients in motor vehicle crashes (12.2%, p=0.0062). SSI rates stratified by Injury Severity Score (ISS) less than or equal to 16 (23/255 [9%]) versus ISS greater than 16 (15/104 [14%]) trended toward more severely injured patients developing SSI, p=0.1347. SSI rate was similar in patients who did and did not receive post-operative antibiotics (14.7% vs. 9.6%, p=0.2556). Type of antibiotic, duration of post-operative antibiotic administration, and duration between injury and surgery did not effect SSI rate.

CONCLUSIONS: Findings suggest that following surgical treatment of mandible fractures, open surgery, open fractures, and risk factors including substance abuse, traumatic dental injury, and mechanism of injury significantly increase SSI rates, while post-operative antibiotics do not appear to provide additional benefit compared to pre-operative antibiotics alone.

**LEVEL OF EVIDENCE:** Therapeutic study, level IV.

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**Title**
Contemporary Issues in the Open Management of Subcondylar Fractures of the Mandible. [Review]

**Source**

**Abstract**
Subcondylar fractures encompass a large portion of mandible fractures. Owing to their proximity to the temporomandibular joint and difficulty achieving surgical exposure, treatment of these fractures has been challenging and highly debated throughout the literature. While no one modality is the accepted gold standard, there are multiple options for addressing these fractures that can yield satisfying results for both patient and surgeon alike. A thorough literature review was conducted using PubMed, analyzing articles in the past 15 years for relevance to the subject matter. Various search terms were used to glean information regarding closed treatment, open treatment, and the risks and benefits of the different surgical approaches involved. The articles were reviewed by all of the authors for applicability and quality of data provided. A total of 50 articles were selected for inclusion in the current study. The open management of subcondylar fractures encompasses a vast array of techniques. While some surgeons advocate closed treatment in some circumstances, open treatment affords numerous advantages with the advent of multiple access modalities. There is no single superior method, and as such, the craniofacial surgeon should have a comprehensive understanding of options so as to select the appropriate option that is individualized to the patient. A clear understanding of fracture biomechanics balanced with patient expectations and operative safety allows for the surgeon to make a sound decision for treatment.
Regeneration or replacement? A case report and review of literature. [Review]

Endodontic treatment of immature necrotic teeth is a real challenge. Recently, a biologically based treatment strategy, referred to as regeneration, has been introduced. Tissue regeneration requires the presence of stem cells, a scaffold, and growth factors. Endodontic regeneration may improve the prognosis of immature necrotic teeth by re-establishing the functional pulpal tissue and further development of the root. However, the tissue formed in the pulpal space may not be original pulp tissue, and in some cases, it may result in uncontrolled calcification of the pulp. This study reports a case of successful endodontic regeneration and compares this process with the normal development of the contralateral tooth. Finally, it discusses the nature of the tissue formed during endodontic regeneration.

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Total Alloplastic Joint Reconstruction in a Patient With Temporomandibular Joint Ankylosis Following Condylar Dislocation Into the Middle Cranial Fossa. [Review]

Purpose: Traumatic dislocation of the mandibular condyle into the middle cranial fossa is an extremely rare complication of maxillofacial injury. Management case of the of dislocation of the mandibular condyle complicated by bilateral temporomandibular joint ankylosis is presented.

Materials and Methods: A 17-year-old male patient presented to the outpatient clinic complaining of inability to open his mouth following a motor vehicle accident 6 months prior. Examination revealed bilateral TMJ ankylosis following left condylar head fracture and dislocation of the right condylar head into the middle cranial fossa. Bilateral total alloplastic TMJ reconstruction was performed.
RESULTS: MIO at a three-year follow-up was 35mm, occlusion was intact and the patient was functioning optimally.

Purpose: The risk of developing concomitant medication-related osteonecrosis of the jaw (MRONJ) in patients who have sustained an atypical femoral fracture (AFF) in association with parental administration of a bisphosphonate osteoclastic inhibitor medication for malignant disease is unclear. Published data were searched to determine the prevalence of these concomitant adverse medication events, if any.

Materials and Methods: A systematic review of published case series in the PubMed database was undertaken to ascertain the prevalence of patients having a concomitant history of AFF and MRONJ. The data were analyzed to provide prevalence rates of these events from the literature.

Results: Two case series were identified that delineated the risk (25 and 33%, respectively) of concomitant development of MRONJ and AFF in recipients of parenteral bisphosphonate medication administered for malignant disease.

Conclusion: The published data suggest that approximately 30% of patients receiving parenteral bisphosphonates and having sustained an AFF could develop comorbid MRONJ.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

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Title
Pediatric Maxillofacial Trauma: A Review of 156 Patients.

Source

Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, BDA MEMBERS CAN ALSO ACCESS THIS JOURNAL ONLINE FROM 2011 TO DATE. Go to www.bda.org/ejournals

Abstract
PURPOSE: To review the epidemiology and management of facial fractures in a pediatric population.

MATERIALS AND METHODS: This study was a retrospective review of patients younger than 18 years who presented to a pediatric emergency department during a 5-year period in an urban, academic, level 1 designated trauma center.

RESULTS: Of the 156 patients identified, most were boys (87%) and the mean age was 13.5 years (standard deviation, 4.9 yr; interquartile range, 12 to 17 yr). The most common mechanism of injury was assault (48.1%). Mandibular fractures (40.7%) were most common. Multiple fractures occurred in 26.9% of patients. Concomitant injuries occurred in 73.7% of patients, most commonly concussions (39.1%). Intracranial hemorrhages were associated with panfacial (P = .005), frontal (P = .001), and orbital (P = .04) fractures. Most patients (91.7%) were admitted, and nonoperative repair was undertaken in 57.1%. There was an independent association of surgical intervention with age older than 14 years and with mandibular fractures (P < .01).

CONCLUSIONS: Assault was the most common mechanism of injury and mandibular fracture was the most commonly encountered. Concomitant nonfacial injuries occurred in most patients. Patients sustaining parfacial, frontal, and orbital fractures should provoke an evaluation for other intracranial injuries. Children older than 14 years and those with mandibular fractures should prompt mobilization of resources for operative repair.

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Title
Intermaxillary Fixation Screw Morbidity in Treatment of Mandibular Fractures-A Retrospective Study.

Source

Local Messages
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Abstract
PURPOSE: The aim of the present retrospective study was to investigate the morbidity of screws used for intermaxillary fixation (IMF) in the treatment of mandibular fractures. A review of the published data was also performed for a comparison of outcomes. Our hypothesis was that the use of screws for IMF of mandibular fractures would result in minimal morbidity.

MATERIALS AND METHODS: Patients treated for mandibular fractures from 2007 to 2013, using screws for IMF, using the international diagnosis code for mandibular fracture, DS026, were anonymously selected (Department of Oral and Maxillofacial Surgery, Rigshospitalet, University Hospital of Copenhagen, Copenhagen, Denmark). The fracture type, radiographic findings,
Recent Reviews Related to Dentofacial Trauma

**RESULTS:** A total of 156 patients had undergone IMF with screws. The total number of screws was 793. The incidence of root lesions was 0.25% centrally and 0.88% peripherally. The incidence of screw loss was 0.13% and that of screw loosening was 1.89%. In the review, 737 related reports were identified in a search of PubMed and the Cochrane Library. Of these, 25 were considered suitable for inclusion. A lack of valid evidence resulted in a descriptive analysis, because a meta-analysis of the data was not possible.

**CONCLUSIONS:** The results of the present retrospective study have shown that the use of screws is a valid choice for IMF in mandibular fracture treatment with minimal morbidity. The 793 screws used for IMF resulted in a negligible amount of central and peripheral tooth root trauma.

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**INTRODUCTION:** The detection of vertical root fractures (VRFs) is a significant challenge for clinicians. Cone-beam computed tomographic (CBCT) imaging has been used recently in this field with high accuracy and sensitivity. Research results about its superiority over periapical radiographs (PRs) are mixed and inconclusive. The aim of this review and meta-analysis was to provide evidence about the accuracy of CBCT imaging in diagnosing VRFs in human teeth with and without endodontic treatment compared with conventional/digital radiography and to establish optimal imaging parameters for accurate VRF detection using CBCT imaging through a systematic approach.

**METHODS:** A search for eligible studies was conducted from January 1990 to November 2013 in PubMed, Embase, and Cochrane Central Register of Controlled Trials. The Quality Assessment of Diagnostic Accuracy Studies 2 and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklists were used to assess the quality of the included studies. Statistical pooling of sensitivity, specificity, and the diagnostic odds ratio were calculated using random effects meta-analysis model and depicted through paired forest plots. The presence of heterogeneity of the included studies was also estimated.

**RESULTS:** Eleven studies qualified for systematic review, and 4 studies were considered for meta-analysis. Pooled sensitivity, specificity, and the diagnostic odds ratio of CBCT imaging and PR in filled and unfilled teeth were as follows: CBCT imaging (filled): 0.752, 0.652, and 5.527; PRs (filled): 0.242, 0.961, and 8.586; CBCT imaging (unfilled): 0.776, 0.946, and 94.26; and PRs (unfilled): 0.425, 0.939, and 14.42, respectively. Overall, studies presented heterogeneity varying from moderate to high.

**CONCLUSIONS:** Results showed better sensitivity and specificity of CBCT scans than PRs in the detection of VRFs in unfilled teeth, particularly when a voxel size of 0.2 mm was used. Low pooled sensitivity and specificity of CBCT imaging was noted in detecting VRFs in endodontically treated teeth.
Reduction of isolated zygomatic arch fractures using dental instrument: Report of 2 cases and review of the literature. [Review]

Source

Abstract
To assess the effectiveness of a dental instrument for reduction of isolated zygomatic arch fractures. Two patients were admitted to our clinic representing isolated unilateral zygomatic arch fracture. The common presenting complaints were pain, swelling and difficulty in mouth opening. Fractures were confirmed with plain radiography and computerized tomography. The fractures were reduced with upper buccal sulcus approach by dental instrument. Patients achieved satisfactory maximum mouth opening within 10 days. At follow up after 6 months, there was complete healing without any complication. This procedure is cost effective, time saving, safe and effective to manage isolated zygomatic arch fractures under local anaesthesia with satisfactory outcomes.

Stylo-mandibular complex' fracture from a maxillofacial surgeon's perspective--review of the literature and proposal of a management algorithm. [Review]

Source

Abstract
The incidence of fractures of styloid process, either in isolation or association with mandibular fractures, is rare, and frequently overlooked. When present, they pose clinical dilemma in diagnosis and management. Proper management of styloid fractures is essential, not just to alleviate the patients' symptoms, but also to prevent potential complications like post-traumatic styloid syndrome and injury to adjacent vital structures. This article features a review of literature on 'styloid fracture concomitant with...
mandibular fracture' along with a case report. The article explores the biomechanics resulting in styloid fracture especially when co-existing with mandibular fractures. The article also enumerates the clinical features of this unusual clinical phenomenon and aims at rationalizing the need for its medical or surgical management. A simple protocol for the management of 'stylo-mandibular complex' fracture has been proposed.

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Abstract Clinicians face numerous challenges when managing psychiatric patients who self-inflict injuries within the maxillofacial region. In addition to a complex clinical examination, there are both surgical and psychiatric factors to consider, such as the risk of damaging vital structures, the exacerbation of the patient's psychiatric status, and the long-term psychosocial and aesthetic sequelae. We present 2 cases of adolescents who repeatedly self-inflicted wounds and/or inserted foreign bodies (FBs) into the face, scalp, and neck. The different treatment modalities were based on full evaluation of the patient's clinical, medical, and diagnostic test findings coupled with a psychiatric assessment. The decision for conservative management or surgical intervention was made according to the presence and location of the FBs, degree of hemorrhage, signs and symptoms of infection, and unpleasant scars that could lead to long-term psychological impairment. In most cases, the FBs were removed and the wounds were toileted and closed under local or general anesthesia. We advocate a holistic approach via a multidisciplinary team, which is deemed essential to provide the highest quality of care for patients to reduce the risk of further relapses. Lastly, a satisfactory esthetic outcome is always paramount to achieve long-term psychological and physical welfare.

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The restoration of a traumatized tooth may require minimally invasive or more extensive treatment options. The majority of injuries occur in the younger population, so management should consider the long-term outcome, failure and future treatment needs over the course of, often, many decades. The aim should be to provide a tooth-restoration complex that closely mimics the functional and aesthetic qualities of an intact tooth for as long as possible. This narrative review will assess the relevant literature pertinent to restoration of traumatized teeth in order to provide guidance for the practising clinician.

Endodontic management of the permanent immature tooth continues to be a challenge for both clinicians and researchers. Clinical concerns are primarily related to achieving adequate levels of disinfection as 'aggressive' instrumentation is contraindicated and hence there exists a much greater reliance on endodontic irrigants and medicaments. The open apex has also presented obturation difficulties, notably in controlling length. Long-term apexification procedures with calcium hydroxide have proven to be successful in retaining many of these immature infected teeth but due to their thin dentinal walls and perceived problems associated with long-term placement of calcium hydroxide, they have been found to be prone to cervical fracture and subsequent tooth loss. In recent years there has developed an increasing interest in the possibility of 'regenerating' pulp tissue in an infected immature tooth. It is apparent that although the philosophy and hope of 'regeneration' is commendable, recent histologic studies appear to suggest that the calcified material deposited on the canal wall is bone/cementum rather than dentine, hence the absence of pulp tissue with or without an odontoblast layer.
External inflammatory resorption is one of the potential consequences of trauma to the teeth. It occurs when there has been loss of cementum due to damage to the external surface of the tooth root during trauma, plus the root canal system has become infected with bacteria. It is characterized by the radiographic appearance of loss of tooth substance with a radiolucency in the adjacent periodontal ligament and bone. The loss of cementum allows the intracanal bacteria and/or their endotoxins to reach the periodontal ligament more readily and this can lead to the development of the inflammatory resorptive process. External inflammatory resorption can ultimately lead to loss of the tooth if it is not managed in a timely manner. There are some injuries that are very likely to develop this type of resorption and a preventive approach can be adopted by commencing root canal treatment immediately as part of the emergency management of such cases. In cases where the resorptive process is already established, root canal treatment can arrest the resorption and encourage hard tissue repair. The use of a corticosteroid-antibiotic intracanal medicament has been shown to be particularly useful in the prevention and management of external inflammatory resorption. Calcium hydroxide should not be used as an immediate medicament because of its inherent toxicity and irritant properties but it is valuable as a subsequent medicament to encourage hard tissue repair where required. This review outlines the external inflammatory resorptive process and the management strategies that can be employed to prevent it from occurring, and to treat it if already present.

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Abstract

With advances in the understanding of healing processes of the periodontium, pulp and alveolar bone following various injuries, the role of splinting has become relatively well defined. This is generally reflected in the guidelines for trauma management published by the International Association of Dental Traumatology. While the widespread use of composite resin as an adhesive in various functional/flexible splinting systems has over many years allowed ease of application, removal of the material is not only time consuming but more seriously accompanied by minor or major iatrogenic damage to enamel. Dental materials science has continued to provide new materials and amongst them the development of resin activated glass-ionomer cement suitable for orthodontic bracket cementation has allowed the development of an alternative simplified splinting regimen for traumatized teeth which offers ease of application and removal with minimal or no iatrogenic damage to enamel.

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Title

Splinting of teeth following trauma: a review and a new splinting recommendation. [Review]
Responses of the pulp, periradicular and soft tissues following trauma to the permanent teeth. [Review]

Source

Abstract
Trauma to the permanent teeth involves not only the teeth but also the pulp, the periodontal ligament, alveolar bone, gingiva and other associated structures. There are many variations in the types of injuries with varying severity and often a tooth may sustain more than one injury at the same time. In more severe trauma cases, there are many different cellular systems of mineralized hard and unmineralized soft tissues involved, each with varying potential for healing. Furthermore, the responses of the different tissues may be interrelated and dependent on each other. Hence, healing subsequent to dental trauma has long been known to be very complex. Because of this complexity, tissue responses and the consequences following dental trauma have been confusing and puzzling for many clinicians. In this review, the tissue responses are described under the tissue compartments typically involved following dental trauma: the pulp, periradicular and associated soft tissues. The factors involved in the mechanisms of trauma are analysed for their effects on the tissue responses. A thorough understanding of the possible tissue responses is imperative for clinicians to overcome the confusion and manage dental trauma adequately and conservatively in order to minimize the consequences following trauma.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

Title
Epidemiology and outcomes of traumatic dental injuries: a review of the literature. [Review]

Source
Australian Dental Journal. 61 Suppl 1:4-20, 2016 Mar.

Abstract
Dental trauma is a significant public health problem because of its frequency, impact on economic productivity and quality of life. It is not a disease and no individual is ever at zero risk of sustaining these potentially life-changing injuries. The aim of this article was to review the literature on the prevalence, incidence, aetiology, prognosis and outcomes of dental trauma. The importance of standardized reporting, oral health policy, adjunctive research methods, prevention and education will also be discussed. A search for relevant articles appearing in databases such as Medline, Cochrane and SSCI formed the basis of this review. Epidemiological studies indicate the annual incidence of dental trauma globally is at about 4.5%. Approximately one-third of children and toddlers (primary teeth) and one-fifth of adolescents and adults (permanent teeth) sustained a traumatic dental injury. The majority involved the maxillary central incisors, mainly from falls in toddlers at home and contact sport in adolescents. Despite these trends, there is considerable variation between studies within and across jurisdictions. There is a need to standardize research with a consistent approach to reporting, classification and methodology. This will improve research and form a greater basis for predicting prognosis. This research basis will assist in consent and clinical management.

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Purpose: Traumatic injuries of the mandible resulting in intrusion of the condyle into the middle cranial fossa are rare and treatment is often based on anecdotal experience. The objective of this study was to develop an algorithm for the management of condylar intrusion injuries by identifying factors that influenced the treatment decision of closed versus open reduction of the condyle.

Materials and Methods: This study was a systematic review of the literature on intracranial intrusion injuries of the mandibular condyle. A thorough search of the PubMed and Cochrane databases and individual maxillofacial and craniofacial journal databases was conducted using the Medical Subject Heading terms condylar impaction, condylar dislocation, condylar intrusion, and middle cranial fossa and condyle without date and language restriction. Quantitative data on the patient's age, gender, etiology of injury, and time from injury to diagnosis were analyzed using descriptive statistics. The authors studied how the predictor variables of age, etiology, time from injury to diagnosis, and associated neurologic injuries influenced the outcome variable of closed versus open reduction of the condyle.

Results: Forty-eight of the 62 retrieved case reports, case series, and review articles were published in the English-language literature from 1963 to 2015. Data on 51 patients with these injuries showed that 38 (75%) were female and younger than 30 years. The most common etiology of injury was motor vehicular accidents, occurring in 25 of 51 patients (49%). The mean time from injury to diagnosis was 31.2 days (0 to 106.4 days). Forty of the 51 patients (78%) were diagnosed within the first 2 weeks of injury. A good proportion of patients underwent open reduction (63%) and 18 of the 51 of patients (35%) underwent closed reduction.

Conclusions: Predictor variables that influenced the treatment decision of open versus closed reduction were age of the patient, etiology of injury, and time from injury to diagnosis. Based on the present results, younger patients (0 to 15 yr old), patients who sustain condylar intrusion injuries from bicycle accidents, and those diagnosed within the first 2 weeks of injury are more likely...
to benefit from closed reduction. The treatment algorithm emphasizes the importance of assessment of associated neurologic injuries and an interdisciplinary approach for the management of these injuries.

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Title
A Review of Hard Palate Fracture Repair Techniques. [Review]

Source

Abstract
PURPOSE: Hard palate trauma is a relatively infrequent occurrence compared with other craniofacial injuries. Several techniques of hard palate fracture repair have been described. To date, there is no consensus on the optimal management of this type of fracture. The purpose of this study was to compile and analyze studies describing hard palate fracture repair techniques with outcomes data.

MATERIALS AND METHODS: A systematic review of the Medline, Scopus, and Web of Science databases was performed for articles describing hard palate fracture repair techniques.

RESULTS: Eight articles were ultimately included in the review. Of the collective 310 fractures reported, postoperative malocclusion occurred in 21 of 235 cases (8.9%) and other complications occurred in 13 of 299 cases (4.3%). The most important variability in technique was the method of palatal vault stabilization. Three studies described wiring techniques, 3 described internal fixation techniques, and 2 described external fixation techniques. Studies describing internal fixation techniques reported higher rates of wound complications. Proponents of rigid internal fixation believe that this technique provides better fracture reduction. External fixation techniques appear to impart low rates of wound complications, but their overall effectiveness remains in question.

CONCLUSIONS: Hard palate fractures are associated with high rates of malocclusion and wound complications. The most established methods of palatal vault stabilization are closed reduction with wiring and internal plate fixation. Depending on the fracture type, patient comorbidities, and associated injuries, either technique might be preferable in a given circumstance.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

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Title
Inaugural Survey on Practice Patterns of Orbital Floor Fractures for American Oral and Maxillofacial Surgeons. [Review]

Source

Local Messages
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Abstract
PURPOSE: In recent years, several studies have reported on practitioners' preferences for the treatment of orbital floor fractures, showing widely varying practice patterns. The purpose of the present study was to identify the practice patterns among oral and maxillofacial surgeons involved in the management of orbital floor fractures in the United States and compare them with the available published data.

MATERIALS AND METHODS: An anonymous survey was created and electronically mailed to surgeons. We also reviewed the published data on orbital floor fractures using a PubMed and MEDLINE search. The responses to the survey were analyzed using descriptive statistics.

RESULTS: The factors that had the greatest influence on the surgeon's decision to operate were a defect size > 2 cm², enophthalmos, entrapment, and persistent diplopia. The most common surgical approach reported was a preseptal transconjunctival approach (32.0%), followed by the subciliary (27.9%) and postseptal transconjunctival (26.2%) approaches. The most commonly reported implant for orbital reconstruction was titanium (65.4%), followed by Medpor (43.7%) and composite Medpor and titanium (26.4%). The review of the published data showed a consensus among many of the operative indications mentioned, including a large defect size, enophthalmos, clinical entrapment, and persistent diplopia.

CONCLUSIONS: Oral and maxillofacial surgeons in the United States have a wide range of practice habits in the management of orbital floor fractures. Although the quality of the available evidence is poor, it supports a consistent approach to the management of orbital floor fractures in terms of the indications and surgical approach. The choice of reconstructive material and timing of repair remain more controversial. A clear need exists for improvement in the available data to help guide and set standards of care for the specialties managing orbital floor fractures.

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Title
Unusual Presentation of Guillain-Barre Syndrome After Mandibular Fracture Treatment: A Review of the Literature and a New Case. [Review]

Source

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Abstract
Guillain-Barre syndrome (GBS) is a multifactorial and lethal inflammatory demyelinating neuronal disorder with concurrent polyradiculopathy and polyneuropathy presentations. This rare syndrome affects the peripheral nerve myelin sheath and is characterized by ascending muscle weakness and paralysis. There have been rare reports of GBS after head or brachial plexus trauma, general anesthesia, neurosurgery, orthopedic surgery, cesarean section, laparoscopy, and general surgery, and the
occurrence of GBS after oral and maxillofacial surgery is not common. A review of the related literature and a new case of GBS after maxillofacial surgery are presented.

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Title
Knowledge of trainers of retarded care centers about tooth avulsion. [Review]

Source

Abstract
Dental trauma has always been a common problem in dental health while mentally challenged children are more susceptible to it. This interventional study was conducted to evaluate the knowledge of trainers of mentally challenged children care centers about the management of dental trauma, and participants voluntarily took part in the study. A questionnaire containing demographic questions, and 12 questions related to the knowledge of trainers about the emergency management of avulsed teeth were designed. Each correct answer gave one score, and eventually, teachers who had correctly answered between 0 to 6 questions were considered to have limited real knowledge about the issue (from 7 to 9 medium, and from 10 to 12). In the second phase, an educational intervention was done to enhance the knowledge of trainers by distributing brochures in care centers. Finally, data were analyzed by Chi-square test. In this study, almost all participants were females (97%). Results illustrated that more experienced trainers and elder ones were relatively more knowledgeable than their younger and less experienced co-workers. Also, teachers working in private care centers had more knowledge than those working in the public sector. However, the knowledge about the management of dental traumas was unsatisfactory at first, yet it was hugely promoted after the educational intervention was carried out, which indicated the importance of conducting other educational interventions for the improvement of the management of dental traumas.
PATIENTS AND METHODS: The data were collected from the records of the patients who reported to the Department of Oral and Maxillofacial Surgery, Goa Dental College and Hospital between 2005 and 2010. The site of fracture, age of patient, etiology of trauma, daily and monthly variation of the fractures was analysed.

RESULTS: Records of 2,731 patients sustaining maxillofacial injury were examined. The most commonly fractured facial bone was the mandible followed by zygomaticomaxillary complex. Most fractures occurred in the third and fourth decade of life with male and female ratio of 6:1. Main etiology was road traffic accidents.

CONCLUSION: Despite strict traffic legislation, road traffic accidents are the main cause of maxillofacial injuries.

Abstract
BACKGROUND: Traumatic dental injuries (TDI) are common, and appropriate treatment will maximize the chances of maintaining teeth in function while safeguarding their longevity and aesthetics. Subjectively, it appears that outcome measures used in studies investigating TDI are numerous and diverse.

OBJECTIVES: To undertake a systematic review of the outcomes used in clinical trials of treatment interventions following traumatic dental injuries.

DATA SOURCES: The MEDLINE, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews and EMBASE databases were searched up to June 2014. Reference lists of eligible studies were cross-checked to identify additional studies and strategies to identify grey literature and ongoing trials were employed.

STUDY SELECTION: Two authors independently assessed studies for inclusion and undertook data extraction. The study designs included were as follows: systematic reviews with/without meta-analyses, randomized and pseudo-randomized controlled trials and controlled clinical trials. There were no language restrictions.

RESULTS: Ten studies confined to two types of TDI were included: avulsion (5) and non-vital immature permanent incisor teeth (5). The outcomes reported predominantly concentrated on injury activity and the physical consequence of injury. There was little consistency between studies for the length of follow up, the time points at which outcomes were evaluated or the methods used to measure them.

CONCLUSIONS: There is significant heterogeneity in outcomes reported for TDI in the literature. These findings preclude meaningful meta-analysis between studies. Future clinical studies need to consider collecting a more consistent and wider range of outcomes, which should include one or more from each of the following domains: health resources utilisation, adverse effects and quality of life and family outcome. There is a clear need for the development of a Core Outcome Set for TDI using robust and established methodology, thus optimizing the value of future research.
Replacement of severely traumatized teeth with immediate implants and immediate loading: literature review and case reports.

One of the options for management of severely traumatized dentitions is to provide immediate implant placement with immediate loading. Three representative cases out of 15 patients with 23 traumatized teeth treated to date in our clinic are presented. None had labial bone fractures. The teeth were replaced with NobelReplace Groovy implants (Nobel Biocare, Gothenburg, Sweden) in the fresh sockets immediately after extraction. They were placed toward the palatal areas in the sockets and 3 mm below the gingival margins. If there were gaps between implants and sockets wider than 1 mm, particulate deproteinized bovine bone was grafted in the gaps. Immediately after placement, the implants were loaded with provisional prostheses. The final restorations were installed 3-4 months later. The patients were reevaluated clinically and radiographically 1-3 years after the final restorations had been placed. In all 15 patients, excellent functional and esthetic results were achieved. No implants showed radiolucency, peri-implant suppuration, or mobility. The patients were satisfied with the results. Immediate implant placement with immediate loading is an option that provides good treatment outcomes and allows good functional and esthetic results, as well as addressing the social/psychological aspects of dental trauma.
determine when calcification following replantation of an avulsed immature tooth begins and to evaluate the prevalence of PCO in these cases.

MATERIALS AND METHODS: Electronic database MEDLINE via Ovid, PubMed, Cochrane, and Web of science databases were searched. Hand searching was performed through reference lists of endodontic and trauma textbooks, endodontic and trauma-related journals, and relevant articles from electronic searching. Pooled data from the selected articles were analyzed for prevalence of healing and PCO as well as mean first evidence of PCO.

RESULTS: Pulp healing after replantation of immature teeth occurred in 32.9%, while pulpal necrosis occurred in 67.1% of teeth. PCO was the most frequent outcome of pulpal healing as it occurred in 96% of healed pulps. First evidence of obliteration was observed from 3 to 14 months with mean time of 9.5 months (95% CI = 4.5-14.5 months).

CONCLUSIONS: PCO is considered the mechanism by which the pulp heals after replantation of avulsed immature permanent teeth. PCO is very fast and can be recognized radiographically during the first year from the onset of the trauma.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

RESULT: Absence of an association between socioeconomic indicators and traumatic dental injury: a systematic review and meta-analysis.

METHODOLOGY: The PubMed, ISI, LILACS, Cochrane Library, and Embase databases were searched for articles addressing possible associations between socioeconomic indicators and TDI in the primary teeth in journals dating from the inception of the databases through to December 2013. Two independent reviewers performed data extraction and analyzed the quality of the studies. Meta-analysis was undertaken. Pooled estimates were calculated with a 95% confidence interval (CI) and odds ratios (OR).

RESULTS: Sixteen articles were included in the systematic review. Children from families with household income less than two times average salary (US$ 592) (OR: 0.77; 95% CI: 0.66-0.90) or more than three times the average salary (US$ 888) (OR: 0.76; 95% CI: 0.65-0.89) had a significantly lower chance of having TDI in the primary dentition. TDI was not associated with socioeconomic status (high vs low - OR: 0.77; 95% CI: 0.43-1.36; high vs medium - OR: 1.03; 95% CI: 0.72-1.48; medium vs low - OR: 0.70; 95% CI: 0.42-1.19), house ownership (owned vs rented - OR: 1.28; 95% CI: 0.98-1.66), mother's schooling (OR: 0.89; 95% CI: 0.74-1.08), or father's schooling (OR: 1.01; 95% CI: 0.62-2.74).

CONCLUSION: The scientific evidence demonstrates that socioeconomic indicators are not associated with TDI in the primary dentition. The evidence of an association between a low income and TDI is weak. In general, studies had low risk of bias. Further prospective cohort studies are needed to confirm this association.

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Are overweight/obese children at risk of traumatic dental injuries? A meta-analysis of observational studies. [Review]

**Source**

**Abstract**
BACKGROUND/AIM: Observational studies which investigated the association between overweight/obesity and traumatic dental injuries (TDI) reported contrasting results. Thus, this meta-analysis was designed to investigate such an association with the highest possible levels of internal and external validities.

MATERIAL AND METHODS: A comprehensive literature search was performed through PubMed, ISI Web of Science, Cochrane Library, Scopus, Google scholar to ensure generalizability. Eligible studies reported clear case and control definitions, exposure assessment. Where possible, odds ratio (OR) adjusted for covariates was extracted. Study quality was assessed through Newcastle-Ottawa Scale (NOS). Only fair-to-good quality studies with NOS scores >=4 were selected. The method to assess the pooled OR was based on the level of between-study heterogeneity, estimated through the Cochran's Q. Reliability of the pooled OR was improved by controlling for publication bias, sensitivity analysis to study inclusion, and subgroup analyses according to tooth type (permanent vs primary teeth) and country where the study was performed (Brazilian studies vs studies from other countries).

RESULTS: Seventeen studies were selected from America, Asia, and Europe, their NOS scores ranged between 4 and 8. Overall, there were almost 28,000 patients, 7400 of them with TDI. The level of publication bias was minimal, and no adjustment was necessary. Between-study heterogeneity was high, and the random-effects method was used to assess the pooled OR, which resulted 1.30 (95% confidence interval, 1.11-1.53; P < 0.05). Sensitivity and subgroup analyses corroborated this estimate.

CONCLUSION: The choice to increase internal and external validity levels decreased the precision of the pooled OR (i.e., confidence intervals were relatively wide). The statistically significant overweight/obesity-TDI association, together with the so-called counterfactual condition (i.e., TDI prevalence was higher among overweight/obese children than among lean children), suggests that causal association between these two conditions is plausible.

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**Diagnosis of acute dental trauma: the importance of standardized documentation: a review. [Review]**

**Source**

**Abstract**
BACKGROUND/AIM: Observational studies which investigated the association between overweight/obesity and traumatic dental injuries (TDI) reported contrasting results. Thus, this meta-analysis was designed to investigate such an association with the highest possible levels of internal and external validities.

MATERIAL AND METHODS: A comprehensive literature search was performed through PubMed, ISI Web of Science, Cochrane Library, Scopus, Google scholar to ensure generalizability. Eligible studies reported clear case and control definitions, exposure assessment. Where possible, odds ratio (OR) adjusted for covariates was extracted. Study quality was assessed through Newcastle-Ottawa Scale (NOS). Only fair-to-good quality studies with NOS scores >=4 were selected. The method to assess the pooled OR was based on the level of between-study heterogeneity, estimated through the Cochran's Q. Reliability of the pooled OR was improved by controlling for publication bias, sensitivity analysis to study inclusion, and subgroup analyses according to tooth type (permanent vs primary teeth) and country where the study was performed (Brazilian studies vs studies from other countries).

RESULTS: Seventeen studies were selected from America, Asia, and Europe, their NOS scores ranged between 4 and 8. Overall, there were almost 28,000 patients, 7400 of them with TDI. The level of publication bias was minimal, and no adjustment was necessary. Between-study heterogeneity was high, and the random-effects method was used to assess the pooled OR, which resulted 1.30 (95% confidence interval, 1.11-1.53; P < 0.05). Sensitivity and subgroup analyses corroborated this estimate.

CONCLUSION: The choice to increase internal and external validity levels decreased the precision of the pooled OR (i.e., confidence intervals were relatively wide). The statistically significant overweight/obesity-TDI association, together with the so-called counterfactual condition (i.e., TDI prevalence was higher among overweight/obese children than among lean children), suggests that causal association between these two conditions is plausible.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

Abstract
In 1985 Andreasen and Andreasen published a paper on the diagnosis of luxation injuries and outlined the importance of standardized clinical, radiographic, and photographic techniques. Now 30 years later, these recommendations remain current in the International Association of Dental Traumatology (IADT) guidelines for the management of dental trauma and describe circumstances surrounding the time of injury, the extent of trauma (e.g., type of luxation injury), healing potential (e.g., stage of root development) as well as information concerning subsequent treatment. The purpose of this review was to include findings for other types of trauma and to discuss more recent studies that augment and/or improve on the original findings from 30 years ago. The present review discusses the use of a standardized clinical registration (pulpal sensibility testing, laser Doppler flowmetry, mobility testing), radiographic survey, and photographic registration of the traumatized patient. Moreover, the value of digital radiographs and recent developments in computer tomography with respect to possible enhancement of the trauma diagnosis are discussed.

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Abstract
The timeliness of treatment after dental trauma is crucial to successful tooth preservation. This article focuses on the emergency treatment of common forms of dental trauma in athletes, both at the site of the injury and at the dental office. When dental injuries happen to young patients, saving the tooth is an absolute priority, because few long-term replacement solutions can be performed in a growing child. Preserving pulpal vitality of immature teeth is essential to allow continued root development.

Abstract
One miniplate compared with two in the fixation of isolated fractures of the mandibular angle. [Review][Erratum appears in Br J Oral Maxillofac Surg. 2016 Jan;54(1):118; PMID: 27110619]

Abstract
The purpose of this study was to compare one miniplate with two in the management of isolated fractures of the mandibular angle as regards wound healing, failure of hardware, weakness of the facial nerve, and overall morbidity, by making a systematic review with a meta-analysis. I made a comprehensive electronic search with no date or language restrictions in October 2014. The inclusion criteria were studies in humans, including randomised or quasi-randomised controlled trials (RCT), controlled clinical trials (CCT), and retrospective studies that compared the morbidity after treatment of such fractures with one and two miniplates. Ten publications were included: three RCT, three CCT, and four retrospective studies. Three studies showed a low, and seven a moderate, risk of bias. There was a significant difference between one and two miniplates in the incidence of wound healing, failure of hardware, weakness of the facial nerve, and overall complications (p=0.04, p =0.05, p=0.002, and p=0.05, respectively). The result of the meta-analysis showed that one miniplate placed on the external oblique ridge provided a significant reduction in the incidence of wound infection and dehiscence, failure of hardware, and overall complications, compared with two miniplates, one placed on the external oblique ridge and one placed on to the ventral surface of mandible to fix the fracture.

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Title
Closed versus open treatment of mandibular condylar process fractures: A meta-analysis of retrospective and prospective studies. [Review]

Source

Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY

Abstract
INTRODUCTION: The treatment of fractures of the mandibular process remains controversial, although there is a trend towards open reduction and internal fixation. This study compared open and closed treatments and assessed the results with a meta-analysis.

MATERIALS AND METHODS: A literature search of PubMed found eight studies that met the search criteria and were included in the meta-analysis.

RESULTS: The studies increasingly suggest better results for open treatment, in terms of mouth opening, protrusion, laterotrusion, pain, and malocclusion. In the meta-analysis, the outcome was significantly better for laterotrusion and protrusion in patients treated by open reduction and internal fixation.

CONCLUSION: Due to the different study protocols and lack of information on classification, follow-up time, and inclusion criteria, comparison of the studies remains difficult and further prospective, randomized studies should examine these issues.

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considered a safe and reliable clinical option for implant placement. In clinical practice, human teeth are usually extracted due to nonrestorable caries, vertical or horizontal root fractures, periodontal disease, or endodontic failure, which is commonly accompanied by inflammation and bacterial contamination. The aim of this case series is to present the adverse effects in humans of clinically undetected root-to-implant contact (CURIC), where implants were unintentionally placed in proximity to undetected retained root fragments. The adverse effects of small (3 to 5 mm) root fragments were detectable 6 to 48 months post implant placement. Three out of seven implants in six patients were removed due to severe coronal bone loss. This differs from retrograde peri-implantitis, where only the apical area of the implant is affected and the coronal portion remains integrated. The detrimental effect of root fragment-to-implant contact is described along with its clinical management. Based on the review of currently relevant data, mixed results have been documented regarding the success of dental implants in proximity to tooth-root fragments. Careful evaluation of long-term, postloading results in humans where hopeless teeth have been extracted due to infection and significant bone loss are required before intentional root fragment retention is considered a safe and reliable clinical option for implant placement.
OBJECTIVES: The aim of this systematic review was to determine the diagnostic accuracy of the mandibular cortical width measurements and porosity in detecting hip osteoporosis.

BACKGROUND: All of the included studies used measurements on panoramic radiographs.

MATERIALS AND METHODS: Studies were included if they compared the radiographic measurements (or index tests) with central dual energy X-ray absorptiometry (DXA) of the hip as the reference standard. A measure of diagnostic accuracy such as sensitivity and specificity or area under the receiver operating characteristic curve was also required for inclusion.

RESULTS: Seven studies were identified. Meta-analysis was not possible because of the heterogeneity of the studies. The studies all demonstrated moderate diagnostic accuracy.

CONCLUSION: If a patient with a thin or porous mandibular cortex is identified by a chance radiographic finding, additional clinical risk factors need to be considered and the patient referred for further investigation with DXA where necessary.
METHODS: The aim of this article was to review the works of this period with respect to pulpal reaction after acute mechanical trauma. These traumas include luxation, avulsion, root fracture, and crown fracture. A PubMed search identified other literature where multivariate analysis was used, and these results were compared with earlier pioneering studies.

RESULTS AND CONCLUSIONS: This article will describe pulpal responses after the said acute injuries and outline the competition that takes place between ingrowth of a new neurovascular system into the traumatized tissue versus bacterial invasion. If there is an intact neurovascular supply to the pulp, then the same immunologic defenses that are found in the rest of the body can function and defend against infection. If this is disturbed in any way, alterations in the pulp (eg, pulp canal obliteration, resorption processes) or pulp death (pulp necrosis) will occur. Intermediary stations in pulpal response (ie, transient apical breakdown) mimicked the cardinal signs of pulp necrosis, which could be reversible and lead to pulpal healing. These processes will also be addressed with respect to a more conservative treatment approach. In young patients, it is of the utmost importance that pulp vitality be maintained to ensure continued root growth and development and an intact dentition.

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Title
In vitro fracture toughness of commercial Y-TZP ceramics: a systematic review. [Review]

Source

Abstract
PURPOSE: The aim of this review was to assess research methods used to determine the fracture toughness of Y-TZP ceramics in order to systematically evaluate the accuracy of each method with regard to potential influencing factors.

MATERIALS AND METHODS: Six databases were searched for studies up to April 2013. The terms "tough", "critical stress intensity factor", "zircon", "yttr", "dent", "zirconia", "zirconium", and "stress" were searched. Titles and abstracts were screened, and literature that fulfilled the inclusion criteria was selected for a full-text reading. Test conditions with potential influence on fracture toughness were extracted from each study.

RESULTS: Ten laboratory studies met the inclusion criteria. There was a significant variation in relation to test method, ambient conditions, applied/indentation load, number of specimens, and geometry and dimension of the specimen. The results were incomparable due to high variability and missing information. Therefore, 10 parameters were listed to be followed to standardize future studies.

CONCLUSIONS: A wide variation in research methods affected the fracture toughness reported for Y-TZP ceramics among the selected studies; single-edge-precracked beam and chevron-notched-beam seem to be the most recommended methods to determine Y-TZP fracture toughness; the indentation methods have several limitations.

CLINICAL SIGNIFICANCE: The accurate calculation of toughness values is fundamental because overestimating toughness data in a clinical situation can negatively affect the lifetime of the restoration.

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Figueiredo FE; Martins-Filho PR; Faria-E-Silva AL.
INTRODUCTION: Teeth requiring endodontic treatment commonly have compromised a coronal tooth structure that often requires the use of an intraradicular post to retain the coronal restoration. Although usually successful, catastrophic failures requiring extraction have been reported in the literature. The aim of this systematic review was to analyze clinical trials and cohort studies that evaluated the incidence rate of root fractures in post-retained restorations. The hypothesis was that the incidence rate related to the use of metal posts was higher than that of fiber posts.

METHODS: A MEDLINE search for clinical studies reporting the incidence of root fractures of restorations retained with fiber posts or metal posts of endodontically treated teeth with a more than 5-year follow-up was conducted from inception to January 2014. Seven randomized clinical trials and 7 cohort studies were included.

RESULTS: The pooled survival rate was 90% (95% confidence interval, 85.5-93.3) for metal-based posts and 83.9% (95% confidence interval, 67.6-92.8) for fiber-reinforced posts. The overall incidence rate of root fractures (catastrophic failures) was similar between metal and fiber posts. Prefabricated metal posts and carbon fiber posts had a 2-fold increase in the incidence rate of root fractures compared with cast metal posts and glass fiber posts, respectively.

CONCLUSIONS: The results of this study did not show significant differences for root fracture incidence between metal- and fiber posts. However, the studies included in this review presented a high risk of bias, and further well-designed clinical studies are required to confirm these findings.
Maxillofacial Fractures: Midface and Internal Orbit - Part I: Classification and Assessment. [Review]

Abstract
Fractures of the midface and internal orbit occur isolated or in combination with other injuries. Frequently, the patients are first seen in emergency rooms responsible for the coordination of initial diagnostic procedures, followed by the transfer to specialists for further treatment. It is, therefore, important for all physicians treating facial trauma patients to understand the basic principles of injuries to the midface. Thus, this article aims to describe the anatomy and the current classification systems in use, the related clinical symptoms, and the essential diagnostic measures to obtain precise information about the injury pattern.

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Does trauma in the primary dentition cause sequelae in permanent successors? A systematic review. [Review]

Abstract
This systematic review sought scientific evidence (in the literature) that trauma in the primary incisors cause sequelae in permanent successors. Also this work verified whether there was a relation between the presence and type of sequelae in permanent teeth with the child's age at the time of injury and type of trauma. Electronic databases, including the PubMed, Scopus, The Cochrane Library, LILACS, and Web of Science were used to search for original articles up to June 2013. Prospective and retrospective studies that assessed the association of trauma in deciduous incisors and developmental disturbances in permanent successors were selected. Two authors independently reviewed and extracted the data from the included studies. A methodological quality assessment evaluation of the selected studies was performed. The search retrieved 258 citations. Initially, 19 studies fulfilled the selection criteria; however, one (1) was excluded, leaving 18 for the final selection. Despite some limitations in the study designs were observed, especially the lack of a control group in most studies, the evidence found suggests that individuals with trauma in their primary incisors have more developmental disorders in the permanent successors than individuals without a previous trauma. Furthermore, the younger the child is at the time of injury, the more frequent and more severe are the sequelae to the permanent successor incisors. More severe traumas such as intrusion and avulsion are associated to more serious developmental disorders. These results should be analyzed carefully because very few studies evaluated had a control group.

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BACKGROUND/AIM: The association between large overjet and traumatic dental injuries (TDIs) to anterior teeth is documented. However, observational studies are discrepant and generalizability (i.e. external validity) of meta-analyses is limited. Therefore, this meta-analysis sought to reconcile such discrepancies seeking to provide reliable risk estimates which could be generalizable at global level.

MATERIAL AND METHODS: Literature search (years 1990-2014) was performed (Scopus, GOOGLE Scholar, Medline). Selected primary studies were divided into subsets: ‘primary teeth, overjet threshold 3–4 mm’ (Primary3); ‘permanent teeth, overjet threshold 3–4 mm’ (Permanent3); ‘permanent teeth, overjet threshold 6 +/- 1 mm’ (Permanent6). The adjusted odds ratios (ORs) were extracted. To obtain the highest level of reliability (i.e. internal validity), the pooled OR estimates were assessed accounting for between-study heterogeneity, publication bias and confounding. Result robustness was investigated with sensitivity and subgroup analyses.

RESULTS: Fifty-four primary studies from Africa, America, Asia and Europe were included. The sampled individuals were children, adolescents and adults. Overall, there were >10 000 patients with TDI. The pooled OR estimates resulted 2.31 (95% confidence interval - 95CI, 1.01-5.27), 2.01 (95CI, 1.39-2.91) and 2.24 (95CI, 1.56-3.21) for Primary3, Permanent3 and Permanent6, respectively. Sensitivity and subgroup analyses corroborated these estimates.

CONCLUSIONS: Reliability and generalizability of pooled ORs were high enough and made it possible to assess that the fraction of global TDIs attributable to large overjet is 21.8% (95CI, 9.7-34.5%) and that large overjet is co-responsible for 235 000 global TDI cases (95CI, 104,760,000-372,168,000). This high global burden of TDI suggests that preventive measures must be implemented in patients with large overjet.
Current clinical assessment and imaging techniques were described in part 1, and this article presents a systematic review of the surgical treatment principles in the management of midface and internal orbit fractures from initial care to definitive treatment, including illustrative case examples. New developments enabled limited surgical approaches by standardization of osteosynthesis principles regarding three-dimensional buttress reconstruction, by newly developed individualized implants such as titanium meshes and, especially for complex fracture patterns, by critical assessment of anatomical reconstruction through intraoperative endoscopy, as well as intra- and postoperative imaging. Resorbable soft tissue anchors can be used both for ligament and soft tissue resuspension to reduce ptosis effects in the cheeks and nasolabial area and to achieve facial aesthetics similar to those prior to the injury.

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**Title**
Maxillofacial Fractures: Midface and Internal Orbit-Part II: Principles and Surgical Treatment. [Review]

**Source**

**Abstract**
Current clinical assessment and imaging techniques were described in part 1, and this article presents a systematic review of the surgical treatment principles in the management of midface and internal orbit fractures from initial care to definitive treatment, including illustrative case examples. New developments enabled limited surgical approaches by standardization of osteosynthesis principles regarding three-dimensional buttress reconstruction, by newly developed individualized implants such as titanium meshes and, especially for complex fracture patterns, by critical assessment of anatomical reconstruction through intraoperative endoscopy, as well as intra- and postoperative imaging. Resorbable soft tissue anchors can be used both for ligament and soft tissue resuspension to reduce ptosis effects in the cheeks and nasolabial area and to achieve facial aesthetics similar to those prior to the injury.

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**Title**
WITHDRAWN: Domestic violence screening and intervention programmes for adults with dental or facial injury. [Review][Update of Cochrane Database Syst Rev. 2010;(12):CD004486; PMID: 21154356]

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**Title**
Dental trauma prevention during endotracheal intubation--review of literature. [Review]

**Source**

**Abstract**
Endotracheal intubation is a procedure performed during general anaesthesia with the use of an endotracheal tube in order to maintain a patent airway. This routinely used procedure is connected with a risk of complications within the region of the masticatory system. Trauma of teeth, their surrounding structures and the soft tissue of the oral cavity is observed in app. 1.38 per 1000 procedures. The main causes of this damage are the surgical skills and experience of the surgeon, the anatomical conditions present and the mode of conducting the procedure. In order to reduce the risk of postoperative complications, patients with a high risk of sustaining an injury during endotracheal intubation should be equipped with elastic mouthguards, which reduces the possibility of damage. The scoring in a scale of endotracheal intubation difficulty should be used for qualification for the use of such mouthguards.

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This article presents a summary of incident management guidelines for traumatically injured teeth during orthodontic treatment. In addition, treatment of a 17-year-old patient with traumatic extrusion and palatal displacement of the permanent maxillary incisors while undergoing active orthodontic treatment is reported.

The frequency of decreased visual acuity in orbital fractures. [Review]

The aim of this systematic review is to summarize and evaluate the effect of orbital fractures (blowout fractures and nonblowout fractures) on visual acuity. In PubMed search and Scopus search, the terms "orbital fracture OR maxillofacial injury OR facial trauma OR craniofacial fracture," and "visual acuity OR functional outcome OR visual outcome OR improving document of visual acuity OR blindness OR optic nerve neuropathy" were used, which resulted in 1634 and 1152 papers, respectively. Of the 2226 titles excluding 560 duplicated titles, 227 abstracts were reviewed. Of the 227 abstracts reviewed, the authors found 56 potentially relevant full-text articles, of which 5 studies met our inclusion criteria. The odds ratio and 95% confidence intervals from each study were abstracted. The statistical analysis was performed with review manager (The Nordic Cochrane Centre). A summary of 5 studies affirmed that 43 patients among 532 orbital fractures (8.1%) had decreased visual acuity. Twelve patients among 159 blowout fractures (7.5%) had decreased visual acuity. Thirty-one patients among 373 orbital fractures other than pure blowout fractures (8.3%) had decreased visual acuity. In orbital fractures other than pure blowout fractures, the frequency of decreased visual acuity was higher than pure blowout fractures (n = 532, odds ratio, 2.23, 95% confidence interval = 1.06-4.70). Surgeons should acknowledge this with patients before surgery.
effusions. Finally, 17 fractures (100%) showed reactive bone formation at the condylar head.

had developed osteoid hyperplasia and meniscal perforation, and 6 fractures (35.3%) showed resolution o

segments. Also, 15 fractures (88.2%) showed elongation of the disc and thickening of the retrodiscal tissue, 2 fractures (11.1) showed anteromedial displacement of both the disc and the fractured condylar fragment, and 10 fractures (58.8%) showed anteromedial displacement of the condylar fragment with the disc remaining over the residual ramus, tear of the retrodiscal tissue or capsule, and joint effusion. The

effusions. At 3 months after injury, all 17 fractures (100%) continued to exhibit displacement of both th

evidence of perforation of the retrodiscal tissue, and 7 (41.2%) showed tears in the capsule. Finally, all 17 (100%) exhibite

anteromedial displacement of the condylar fragment, anteromedial displacement of both the disc and the fractured condylar fragment, and 10 fractures (58.8%) showed anteromedial displacement of the condylar fragment with the disc remaining over the residual condyle. Also, 11 (64.7%) showed evidence of perforation of the retrodiscal tissue, and 7 (41.2%) showed tears in the capsule. Finally, all 17 (100%) exhibited joint effusions. At 3 months after injury, all 17 fractures (100%) continued to exhibit displacement of both the disc and the condylar segments. Also, 15 fractures (88.2%) showed elongation of the disc and thickening of the retrodiscal tissue, 2 fractures (11.1) had developed osteoid hyperplasia and meniscal perforation, and 6 fractures (35.3%) showed resolution of previous joint effusions. Finally, 17 fractures (100%) showed reactive bone formation at the condylar head.
RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

CONCLUSIONS: ICFs treated with closed reduction consistently result in a specific pattern of temporomandibular joint pathologic features. These pathologic features are characterized by anteromedial displacement of the articular disc, elongation and thickening of the retrodiscl tissue, and reactive bone formation at the condylar head. The presence of a portion of the disc between the residual condyle and the fossa prevented the development of osteoarthritis and ankylosis. Perforation of the bilaminar tissue and contact between the residual condyle and the fossa promoted osteoarthritic changes and ankylosis.

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Title
Is the Erich arch bar the best intermaxillary fixation method in maxillofacial fractures? A systematic review. [Review]

Source

Abstract
BACKGROUND: Intermaxillary fixation is used to achieve proper occlusion during and after oral and maxillofacial fracture surgery. The aim of this systematic review was to compare Erich arch bar fixation with other intermaxillary fixation methods in terms of the operating time, safety during installation, oral health maintenance and occlusal stability.

MATERIAL AND METHODS: An electronic online search was conducted of the Scirus, PubMed, Ovid, Cochrane Library and VHL databases. A clinical trial dating from the inception of the data bases until August 2013 was selected. Studies that compared Erich arch bars with other intermaxillary fixation methods in patients older than 18 years-old were included. The studies were assessed by two independent reviewers. The methodological quality of each article was analyzed.

RESULTS: Nine hundred and twenty-five manuscripts were found. Seven relevant articles were analyzed in this review. The risk of bias was considered moderate for four studies and high for three clinical trials.

CONCLUSIONS: There is not enough evidence to conclude that the Erich arch bar is the best intermaxillary fixation method in cases of oral and maxillofacial fractures.

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Title
The Epidemiology of Mandibular Fractures in the United States, Part 1: A Review of 13,142 Cases from the US National Trauma Data Bank.

Source

Local Messages
PURPOSE: To date, no studies have analyzed the national demographics of mandibular fractures in the United States. This report is part 1 of a 2-part series characterizing the modern demographics, epidemiology, and outcomes of mandibular fractures in the United States. The purpose of this study was to characterize mandibular fractures in relation to age, gender, mechanism of injury, and anatomic location of fracture.

MATERIAL AND METHODS: A retrospective cohort study was conducted using the National Trauma Data Bank (NTDB). The sample was derived from the population of hospitalized patients enrolled in the NTDB from 2001 to 2005 using mandibular fracture (International Classification of Diseases, Ninth Revision codes 802.21 through 802.39) as an inclusion criterion. Patient- and injury-related variables, including age, gender, anatomic location of fracture, and mechanism of injury, were analyzed by Fisher exact and chi(2) testing.

RESULTS: A total of 13,142 patients with mandibular fractures from participating trauma centers were included in the study. Eighty percent of patients were male. Fracture distribution by age was roughly bell-shaped, with fractures occurring most frequently at 18 to 54 years of age. Mechanism of injury differed by gender, with men most often sustaining mandibular fracture from assault (49.1%), followed by motor vehicle accidents (MVAs; 25.4%) and falls (12.8%). Women most commonly sustained mandibular fracture from MVAs (53.7%), followed by assault (14.5%) and falls (23.7%). Falls were a significantly more common mechanism in patients who were at least 65 years old (P < .001).

CONCLUSION: This study sought to characterize the largest, modern, population-based sample of mandibular fractures in the United States. Overall, men had a 4-fold higher incidence, but this distribution varied by age. Similarly, mechanism of injury varied across gender and age range. A better understanding of the influence of age and gender on mechanism of injury and anatomic site is of great clinical importance in the assessment, diagnosis, and treatment of traumatic mandibular fractures.

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CONCLUSIONS: The meta-analysis indicated that interpretation of panoramic radiography based on darkening of the root had a high specificity in predicting IAN injury after mandibular third molar extraction. However, the ability of this panoramic radiography marker to detect true positive IAN injury was not satisfactory.

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Title
Is There Enough Evidence to Regularly Apply Bone Screws for Intermaxillary Fixation in Mandibular Fractures?. [Review]

Source

Local Messages
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Abstract
PURPOSE: Intermaxillary fixation (IMF) is traditionally achieved with arch bars; however, this method has several well-known disadvantages and other techniques, such as bone screws, are available. This study evaluated current evidence regarding these IMF screws (IMFSs) for mandibular trauma and to assess whether this allows a change of treatment protocol for IMF.

MATERIALS AND METHODS: A systematic electronic literature search was conducted in the PubMed, Embase, and Cochrane databases. Titles and abstracts retrieved from the search were screened and evaluated for inclusion and exclusion criteria. The full text of all relevant articles was read and citation lists were checked for any missing references. All randomized controlled trials (RCTs) were subjected to a quality assessment. Included articles were checked for outcome measurements concerning occlusion, operative time, oral hygiene, root trauma, wire-stick injuries, and mucosa overgrowth.

RESULTS: Twenty-two articles (17 case series, 4 RCTs, and 1 cohort study) were included. None of the RCTs scored high methodologic results in the quality assessment. The results suggest IMFSs have similar malocclusion rates as arch bars, fewer wire-stick injuries, improved oral hygiene, and shorter operative time. Root damage is less likely to occur with self-drilling screws and seldom requires treatment.

CONCLUSIONS: Although the methodologic quality of the included studies is poor, self-drilling IMFSs are recommended for temporary per-operative IMF of noncomminuted mandibular fractures. More high-quality studies are required to allow an evidence-based change of protocol.

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RECENT REVIEWS RELATED TO DENTOALVEOLAR TRAUMA

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Title
Treating maxillofacial trauma for over half a century: how can we interpret the changing patterns in etiology and management?.

[Review]
Source

Abstract
OBJECTIVE: The aim of this study was to reveal the changes in the etiology and treatment of maxillofacial fractures in Greece over the period of the last 53 years.

STUDY DESIGN: A patient-oriented retrospective review of clinical and epidemiologic data was performed to include all patients with maxillofacial fractures treated in the Oral and Maxillofacial Surgery Department of KAT General Hospital of Athens. We reviewed the causes of these injuries, their sites, and treatments (outcome variables) over the last 28 years and compared the results with those of a similar study from the same Department from 1960 to 1984 (predictor variable).

RESULTS: The zygomatic complex was the most frequent fracture site in the recent years, whereas the condyle and symphysis were the most common ones in the early period. We observed a remarkable increase of injuries from interpersonal violence (P < .0001) and a divergence from conservative treatment (P < .001) with time.

CONCLUSIONS: Universal agreement exists on the rapidly rising prevalence of facial fractures in the developed countries as a result of physical violence, and the present study confirmed this conclusion. Throughout the last 50 years, there has been a constant tendency of surgeons to adopt the concept of open reduction and internal fixation.

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Title
Mandibular trauma: a two-centre study. [Review]

Source

Abstract
The aims of this study were to assess and compare epidemiological data on mandibular fractures from two European centres and to perform a review of the literature. Between 2001 and 2010, a total of 752 patients with a total of 1167 mandibular fractures were admitted to a hospital in Turin, and 245 patients with a total of 434 mandibular fractures were admitted to a hospital in Amsterdam. The mean age in Turin was 34.8 years and in Amsterdam was 32 years. The age group 20-29 years showed the highest incidence of mandibular fractures in both centres. The fractures were mainly the result of assaults, in agreement with several articles in the recent literature, followed by falls. The continuous long-term and multicentre collection of data on the epidemiology of maxillofacial
trauma is important because it provides the information necessary for the development of preventative measures aimed at reducing the incidence of facial injuries.

BACKGROUND: Optimum treatment of condylar head fractures (CHF) remains subject to controversy. There are currently a variety of alternative techniques applied, data in literature are often inconsistent and especially systematic long-term data on results after treatment by open reduction and internal fixation (ORIF) have so far not been available. This study in hand is the first long-term prospective study of ORIF after CHF based on osteosynthesis with 1.7 mm small-fragment positional-screw osteosynthesis (SFPSO).

METHODS: The study made use of radiologic, anatomic and objective functional parameters (axiography and MRI) to assess vertical height, disk mobility, protrusive and translatory movement as well as potential physical complaints. Included were surgical long-term sequelae after RA, such as incidence of stenosis of the auditory canal, the facial nerve and resulting disturbance of facial skin sensitivity. Retroauricular scars were evaluated according to the Vancouver Scar Scale. Helkimo and RDC/TMD indices were applied for patient's self-assessment of quality of life aspects after ORIF via RA. The sample in the first follow-up trial (FFT) in the years 2003-2004 comprised 26 patients (36 CHF). 22 patients (31 CHF) were re-evaluated in a second follow-up trial (SFT) between 2006 and 2008. A reference collective (43 patients, 56 CHF) treated with ORIF from 1993 to 2000 mainly by mini- or microplates (MMP) served as a surgical control group.

RESULTS: Five years after ORIF all fractured condyles (FC) continued to show stable anatomic restoration of the pre-trauma vertical height. FC treated with SFPSO exhibited a significantly superior range of motion (p < 0.05) of disk and condyle during mouth opening and protrusion compared to a previous MMP reference collective. Also, no difference was found between condylar mobility of FC five years after surgery and non-fractured condyles (NFC). SFPSO had thus successfully achieved a sustainable, stable physiological restoration of protrusive mobility of the articular disk and condyle. Remarkably, these long-term results were even slightly better in SFT vs. FFT (p < 0.05). Except for sporadically occurring minor complaints, the patients' subjective overall long-term perception of the success of the treatment was equally positive to the surgeons' objective assessment.

CONCLUSIONS: This first long-term prospective follow-up study, based on objective assessment tools, demonstrates that in all cases the major goals of ORIF in CHF could be fully achieved. These goals are: restoration of vertical height viz. prevention of occlusal disorders, physiological function of disk and condyle as well as of the lateral pterygoid muscle. Accordingly, ORIF of CHF e.g. with SFPSO and via the RA secures both a long-term functionally and anatomically stable result and as best as possible pain-free result for the patient, a central prerequisite of optimum perceived HRQoL. The paper has been amended by an extensive review part that covers the current knowledge of the major surgical aspects regarding the treatment of condylar head fractures.
C-arm assisted zygoma fracture repair: a critical analysis of the first 20 cases.

MATERIALS AND METHODS: In a prospective study, consecutive patients with isolated, unilateral, displaced zygoma fractures not requiring orbital floor exploration treated using a c-arm-assisted repair technique at the author's institution from 2009 to 2011 were included. Objective outcomes assessed included accuracy of zygoma realignment (on postoperative computed tomogram), ocular globe projection symmetry (using a Naugle exophthalmometer), complication rate, and operative duration. Statistical analysis was performed using the Student t test.

RESULTS: Twenty patients were included. Differences in zygoma projection, width, and height between the uninjured and repaired sides of the face were clinically noteworthy (>3 mm) in the first patient only. Average differences of these parameters for all 20 patients were clinically and statistically insignificant. Differences in ocular globe projection between the uninjured and repaired sides of the face for each patient were no greater than 2 mm. The average difference in globe projection for all 20 patients was also clinically and statistically insignificant. No major complications occurred, and the average operative duration was 76 minutes.

CONCLUSIONS: The present study shows that the c-arm-assisted zygoma fracture repair technique is accurate, has a low complication rate, can be performed quickly, and has a relatively low level of difficulty.
studies in humans, including randomized or quasi-randomized controlled trials, controlled clinical trials, and retrospective studies, that compared ORIF and CT regarding maximal interincisal opening, laterotrusive and protrusive movements, pain, malocclusion, chin deviation on mouth opening, and temporomandibular joint signs or symptoms for the management of unilateral or bilateral adult MCFs. Meta-analysis was conducted only if there were studies of similar comparisons reporting the same outcome measures. For binary outcomes, we calculated a standard estimation of the odds ratio by the random-effects model if heterogeneity was detected; otherwise, a fixed-effects model with a 95% confidence interval was performed. Weighted mean differences or standard mean differences were used to construct forest plots of continuous data.

RESULTS: Twenty-three publications were included: 5 randomized controlled trials, 16 controlled clinical trials, and 2 retrospective studies. Five studies showed a low risk of bias, whereas 18 showed a moderate risk of bias. There were statistically significant differences between ORIF and CT regarding maximal interincisal opening, laterotrusive movement, protrusive movement, malocclusion, pain, and chin deviation on mouth opening (P = .001, P = .001, P = .001, P = .001, P = .001, and P = .05, respectively).

CONCLUSIONS: The result of the meta-analysis confirmed that ORIF provides superior functional clinical outcomes (subjective and objective) compared with CT in the management of adult MCFs.
The aim of the present study was to test whether there is a significant difference in the clinical outcomes between surgical and non-surgical treatment of mandibular condylar fractures. An electronic search was undertaken in February 2014. Eligibility criteria included clinical human studies, either randomized or not. The search strategy resulted in 36 publications. The estimates of an intervention were expressed as the risk ratio (RR) and mean difference (MD) in millimetres. A statistically significant effect was observed for the outcome of post-treatment malocclusion (RR 0.46, P<0.00001), lateral deviation during maximum inter-occlusal opening (RR 0.56, P=0.0001, dichotomous; MD -0.75, P=0.002, continuous), protrusion (MD 0.68, P=0.01), and laterotrusion (MD 0.53, P=0.03) favouring surgical treatment, and for infection (RR 3.43, P=0.03) favouring non-surgical treatment. There was no statistically significant effect on temporomandibular joint pain (RR 0.81, P=0.46) or noise (RR 1.44, P=0.24), or maximum inter-occlusal opening (MD 2.24, P=0.14). The test for overall effect showed that the difference between the procedures significantly affected the incidence of post-treatment complications, favouring surgical treatment, when all dichotomous and continuous outcomes were analysed (RR 0.70, P=0.006 and MD 1.17, P=0.0006, respectively).