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CHURCHILL LIVINGSTONE

O.469 Functional results after endoscope-assisted treatment of bilateral condylar fractures

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Functional results after endoscope-assisted transoral treatment of displaced bilateral condylar mandible fractures.

Objectives: The temporomandibular joint (TMJ) function was evaluated following endoscope assisted transoral open reduction and miniplate fixation of displaced bilateral condylar mandibular fractures.

Patients and Method: The transoral treatment of bilateral condylar fractures was performed in 13 patients from May 2000 to December 2004. Eleven of the 13 patients demonstrated additional mandibular fractures. Out of 26 fractures of the condylar process 11 were located at the condylar neck and 15 subcondylar. One, 6 and 12 months after surgery TMJ function was evaluated.

Results: Anatomic reduction was achieved following endoscope-assisted transoral approach even when the condylar fragment was displaced medially and in fractures with comminution. Good TMJ function was noted 6 and 12 months after surgery. Mouth opening was measured with more than 40 mm without deviation and a post-operative satisfying range of motion with good lateral excursion was found.

Conclusions: Early rehabilitation and preinjury TMJ function were achieved following the minimal invasive anatomic fracture reduction.

O.470 Facial nerve lesions in ORIF of condylar head fractures – Pre- vs. retroauricular approach

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Introduction and Objectives: Temporary or even permanent palsies (mainly frontal branches) represent major complications after ORIF in condylar head/high condylar traumatology. This prospective study evaluates: (a) facial nerve complications associated with pre- or retroauricular approaches in traumatological cases, (b) correlations between lesion rate and surgical approaches.

Material and Methods: 374/476 TMJs (1993–3/2006) underwent surgery for traumatological indications (fractures and removal of OSM). Prospectively nerve palsies and typical complications were assessed for the different surgical accesses: short preauricular ($n = 60$), preauricular with temporal extension ($n = 177$) and retroauricular ($n = 239$).

Results: In total 8 permanent facial nerve lesions were observed (>9 months post-operatively) correlating significantly with the short preauricular approaches without extension (6/8, χ^2-Test, $p < 0.001$) and female gender (7/8, $p < 0.001$). Using retroauricular or extended preauricular approaches each one minor permanent palsy of the frontal branch was seen. Reversible palsies (frontal branches due to hook traction) occurred in 45/476 cases (9.2%), in retroauricular approaches in 7.1% (17/239), in preauricular approaches with temporal extension in 9.6% (17/177), whereas in short preauricular cases in 18.3% (11/60, $p < 0.05$). Temporary palsies restored within mean 2.8 months (median 2, SD 1.8).

Conclusions: Permanent palsies of the frontal branches cannot be definitely excluded using extended or retroauricular approaches (0.5% partial lesions of the frontal branches). However, the idea of an elevated risk of facial nerve lesions could be substantiated for the short preauricular approach only. Temporary lesions in traumatological cases (about 9%) are less frequent than data published for retro- or submandibular approaches. Persistent sensitive disorders, however, were found to be frequent complications.

O.471 Retentive values of different screw types in the spongious bone of the condylar head

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Introduction and Objectives: This biomechanical in vitro trial investigates the retentive values of screws used for the fixation of spongious bone, e.g. for ORIF of condylar head fractures. Different screws were compared regarding material properties, core diameter, number and angulation of threads and screw head design, in a standardized in vitro pull-out experiment.

Material and Methods: Nine different screw types (each 10 screws of 16 mm length) were compared using standardized spongious specimens (condyles of young pigs): A: titanium 1.2 mm (Stryker-Leibinger), 1.5 mm (Medartis), 1.7 mm (Stryker-Leibinger), 1.8 mm (Medartis) and 2.0 mm as monocortical reference (Stryker-Leibinger); B: PLLA-PGA 1.5 mm (Inion) and 2.0 mm screws (Lorenz Surgical). After predrilling and 7 mm insertion into the specimens the screws were pulled-out by a standard testing device modified to exclude lever action, assessing maximum axial tractive forces leading to pull-out or screw deformation.

Results: 1.8 mm titanium bone screws showed best retention with 814.6 N (Kruskal–Wallis test, $p < 0.001$), followed by 1.7 mm titanium-small fragment screws with 655 N, which in turn were superior to the remaining screws ($p < 0.001$). 1.5 mm titanium screws were pulled out at mean 547 N. 1.2 mm titanium and resorbable screws, which showed largely deformations during the experiment presented pull-out values below 400 N (i.e. traction force of the lateral pterygoid muscle and below the monocortical reference 2.0 mm titanium, 528 N).

Conclusions: The superior retention of 1.8 mm titanium bone screws in spongious bone is due to parameters such as thread design and core diameter. Beside the special clinical application in condylar head traumatology the results can be transferred to the fixation of spongious bone, e.g. in alveolar augmentation procedures.

O.472 Endoscopic-assisted surgery in the treatment of mandibular condyle neck fractures

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Indroduction and objectives: Assessment of the practicability and of the outcome of endoscopic-assisted approach in the treatment of condylar neck fractures of the mandible.

Materials and Methods: From August 2001 to January 2006, 16 adult patients were included in the study. Inclusion criteria were: condylar neck fracture, displacement of the proximal fragment, malocclusion, no comminution and possibility to place at least 2 screws in the proximal fragment. Six patients presented other mandibular fractures. All fractures were treated with intraoral and transbuccal approaches, using a transbuccal trochar, and a 30.4 mm endoscope, with a brow lift sheath.

Results: All fractures were explored endoscopically and repaired successfully using rigid fixation. All patients presented adequate anatomic reduction radiographically and stable occlusion with

adequate function and mouth opening. Post-operatively, one patient presented a transient partial deficit of the facial nerve. One patient had a fracture of the plate 3 months post-surgery. All other patients have good aesthetic outcome.
Conclusions: Endoscopic-assisted surgery in the treatment of mandibular condyle neck fracturesis, a minimally invasive technique, with reduced morbidity, which can be applied to selected patients with condylar neck displaced fracture, but requires adeguate training in the use of the endoscope.

O.473 Long-term follow-up of surgical treatment of condylar processes fractures

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Between 1999 and 2005 (7 years) 231 patients were treated surgically for various fractures of condylar process using miniplate osteosynthesis and retromadibular approach. They included 194 males and 37 females aged 14–68 years. The mean age was 33.2 years.
Depending on the intra-surgical visual evaluation of the fracture line in the anatomical region of the condylar process, its fracture was classified according to Gola as one of the three anatomopathological variations: fracture of the head, fracture of the neck or high subcondylar fracture, fracture of the base of the neck or low subcondylar fractures. In 231 patients retromandibular approach was used 242 times. The morphological and functional results obtained following surgical treatment by means of miniplate osteosynthesis with retromandibular access were evaluated on the basis of clinical and radiological follow-up performed in the out-patients clinic. In 231 patients the observation period varied from 6 months up to 7 years post-op.
Analysis of the author's own material suggests that if there are indications for surgical treatment of condylar process fracture using miniplate osteosynthesis, retromandibular access has some significant advantages when compared with other techniques. It is a relatively simple technique. It enables easy access to the fracture, allowing for repositioning and fixation under visual control, and it is one of the safest techniques with regard to the facial nerve.

O.474 Biomechanical photoelastic study comparison of conventional and uni-lock systems for mandibular osteosynthesis

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Introduction: Mandibular osteosynthesis focus on size, shape, number, and biomechanics of plate/screw systems to improve surgical outcome. Conventional systems achieve stability by tightening the screw and fixing the plate to the bone. Morbidity in these systems is related to bone compression. Locking plate/screw systems achieve stability through a device that "locks" the screw to the plate avoiding overpressure to the bone.
Objective: Compare the mechanical behaviour of locking and conventional plate and screw systems, placed under ideal conditions, using the photoelastic method.
Material and Method: We developed a static simulator of the masticatory musculoskeletal system fitted with epoxy resin mandibles that were fractured in the body region, and treated with 2.0 conventional miniplates and 2.0 "uni-lock" plates. We used the tension freezing method that takes advantages of the photoelastic properties of the epoxy resin, to evaluate the the tension lines in the mandibular structure after ostheosynthesis.
Results: The tension line spectra that appear in mandibular probes with the the conventional plate system exhibit important compression features over external mandibular cortical plate. The force line crossed the medular bone to the inner cortical plate. When we used two plates, we found overload in the region between them. Cases using uni-lock plates showed only tension lines around the screw tip caused by screw locking to the plate.
Conclusion: Freezing tension method is the experimental technique of choice to study tension lines produced in the interfase between bone and ostheosynthesis material. Locking ostheosynthesis methods cause less tension lines in the bone–plate interface than conventional plate systems.

O.475 Internal fixation of fractures of the anterior mandible with a novel lag screw system

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Introduction and Objectives: The purpose of this paper was to evaluate a new lag screw system. This system has powerful 2.3 and 2.7 mm screws (18–50 mm in length) particularly useful for combined anterior/posterior fractures of the mandible to prevent flaring of the mandibular arch. The screw head rests on a self-adapting washer to avoid invasive countersinking and overload of the mandibular cortex.
Material and Methods: The system was applied in 36 patients with anterior mandibular fractures (10 patients solitary anterior fracture, 12 patients anterior fracture combined with one posterior fracture, 14 patients combined with two posterior fractures). Ninteen anterior fractures were treated with a single lag screw, 14 cases with two fixation elements. In 6 of the latter one lag screw was combined with one mini- or microplate on the alveolar process, in 8 two lag screws were used. Three patients received 3 fixation elements. In 8 patients 2.3 mm screws were applied to fix lamellar type fractures. Follow up at 1 week, 4 weeks and 6 months post-operative included occlusal evaluation. No mandibulomaxillary fixation was applied for the anterior fractures.
Results: Rapid and safe fixation followed by undisturbed primary bone healing was observed in all patients. The only complication was one firmly osseointegrated 50 mm screw which could not be removed after 7 months in situ. There was no delayed fracture healing and no occlusal problems, especially no flaring of the mandibular arch, i.e. no posterior crossbite.
Conclusions: The system I adequate for solitary and combined anterior mandibular fractures.

Friday, 15 September 2006, 11.00–13.20 Hall 8

Miscellaneous I

O.476 Oral mucosal lesions in adult Finns: health 2000 health examination survey

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Introduction and Objectives: A comprehensive nationwide 'Health 2000 Health Examination Survey' was carried out in Finland in 2000/1. The two-stage cluster sample ($n = 8028$) represented the Finnish population aged 30 years and older.
Material and Methods: Oral health was determined for 79% ($n = 6335$) including recordings of the following oral mu-