Feasibility of Endoscopic Intramedullary Fixation of Fractures of the Mandibular Condyle

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INTRODUCTION

The treatment of mandibular condyle fractures has been a topic of great interest. Intramedullary fixation is a treatment concept which was first described by Giffin and was intended as a treatment for nonoperative management of condylar fractures.1,2 Since then, the biomechanical mechanisms of condylar function in the setting of a fracture, as well as the techniques for reconstruction and fixation of these fractures, have been described.3-5 Intramedullary fixation of condylar fractures is an important aspect of treatment and should be considered in patients with suitable fractures.6,7 It is important to note that other fracture patterns may not be suitable for intramedullary fixation and other fixation methods may be required.8,9

Intramedullary techniques provide rigid fixation to the fractures while avoiding the potential for iatrogenic injury to surrounding structures.4 The optimal implant for use with a transoral endoscopic technique for fixation of these fractures would have greater biomechanical resistance, increased flexibility, and the ability to perform surgery with smaller incisions.10 This is the first report of a novel short-segment implant. Further study will be necessary to determine the material properties of this type of intramedullary implant design and surgical technique for reduction and fixation of fractures of the mandibular condyle.

METHODS AND MATERIALS

The cadaveric specimens were placed in the appropriate anatomical position for transloral endoscopic surgery. An incision was made in the buccal mucosa at the level of the mandibular ramus with a scalpel. Blunt dissection was carried down to the mandibular bone and the endoscope was introduced. A fracture of the mandibular condyle was simulated by the fracture site. Once this was achieved, the screw or the end of the condylar fragment was placed on the mandible. Once the ramus is below the level of the protruding implant its medullary space is maneuvered over the implant and retraction is begun. Adequate surgical exposure, fracture site manipulation, implant insertion, and fracture reduction were demonstrated in this cadaveric model.

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RESULTS

All steps of the surgical procedure were successfully applied in both of the cadaveric specimens. Zero and thirty degree endoscopes provided excellent visualization of the fracture site. The free condylar fragment was then manipulated into a position lateral to the mandibular ramus using a hooked probe instrument (Figure 6). The implant was then carefully rotated into position on the implant using retraction at the sigmoid notch. This was accomplished and upon release of retraction seating was complete. Gentle pressure was applied at the angle of the mandible to complete the reduction and application of the implant.

REFERENCES