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# Use of ultrasound-activated resorbable sheets and pins in the management of fractures of the condylar neck of the mandible: a case series

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**Abstract**

The need to treat fractures of the mandibular condyle remains controversial, but when the decision to operate has been made, then multiple forms of fixation are advocated. Traditionally, metal plates and screws have been used, but this is thought to have several disadvantages, particularly in the growing skeleton. Resorbable fixation for maxillofacial fractures has not gained widespread acceptance because of technical difficulties with the materials and concern about inflammatory reactions during their resorption. Because not all patients have typical fracture patterns that fit the size and shape of metal plates, mouldable resorbable fixation materials can be useful, and ultrasound-activated resorbable sheets and pins have the necessary stability to fix fractures of the condylar neck. We present a series of patients in whom ultrasound-activated resorbable sheets and pins were used to fix condylar fractures in which the fracture pattern did not permit the use of stable metal fixation, or the age of the patient in our opinion precluded the use of metal fixation. There were no perioperative complications and no problems related to the stability of the fixation. Minor swelling relating to the resorption of the material in one case did not require any management.


*Keywords:* Condyle; Fixation; Resorbable

## Introduction

Fractures of the mandibular condyle are relatively common, but remain a controversial area in maxillofacial traumatology.[1–3] We do not intend to debate best practice here, but our policy is to treat fractures of the condyle with displacement that affects function (such as occlusion or mouth opening) by open reduction and internal fixation. While internal fixation is usually done with titanium plates, resorbable fixation has also been shown to provide adequate stability.[4,5] The choice of material, and the size and configuration of plates used, is based on objective measures such as the age of the patient, the nature of the fracture, and the biomechanical forces acting upon it, together with more subjective measures such as the surgeon's experience and expertise.

We present our experience with the use of ultrasound-activated resorbable sheets and pins for the treatment of fractures of the condylar neck in a selected group of five patients, and suggest some indications for their use.

## Patients, material, and methods

The surgical approach was similar in all cases. A retromandibular incision was made that extended to the anterior aspect of the pinna, and either a transparotid or anteroparotid

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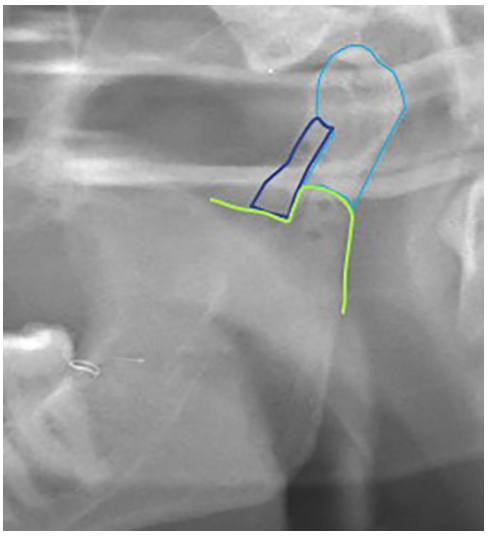

Fig. 1. Section of orthopantomogram showing the comminuted fracture pattern and alignment after fixation (case 1).

dissection done to expose the masseter overlying the fracture. The masseter was retracted and following reduction of the fracture, a poly (dl-lactide) acid resorbable mesh sheet (SonicWeld Rx®, KLS Martin, Tuttlingen, Germany) was warmed in a water bath and, once pliable, adapted to the lateral and posterior aspects of the condyle across the fracture line. The mesh was secured with ultrasound-activated resorbable pins, ensuring that there were at least three pins above and below the fracture line. All wounds were closed in layers, with a suction drain left in overnight. Postoperatively, patients are given care identical to those having titanium fixation (soft diet and avoidance of contact sports for six weeks, and mobilisation of the mandible as pain allowed). Patients were followed up for two years until the expected complete resorption of the fixation to confirm there were no problems, and children are followed up until skeletal maturity.

## Case reports

### *Case 1*

A 58-year-old lady presented after a road traffic collision with grossly deranged occlusion and pain in the anterior mandible and bilateral condylar regions. Radiographs showed a fracture of the mandibular symphysis, a displaced fracture of the right condylar neck, and a comminuted displaced fracture of the left condylar neck. The fractures of the right condylar neck and symphysis were fixed with standard titanium miniplates, but the comminution of the left condylar fracture did not permit stable fixation with standard plates and so a sonic sheet and pins were used (Fig. 1). Two years postoperatively there were no problems with the fixation on the left side and she had normal dietary function and no pain with normal mouth opening. On the right side there was slippage of the fracture that resulted in a small malocclusion that was managed with occlusal adjustment.

### *Case 2*

A 13-year-old boy presented after a fall from his bicycle with pain and swelling in the region of the temporomandibular joint (TMJ) and inability to achieve a satisfactory occlusion. Radiographs showed a displaced fracture of the left condylar neck with 61° angulation and shortening of the ramus-condyle by 6 mm; he was treated by open reduction and internal fixation with a resorbable sheet and pins. He experienced some swelling of the left preauricular region eight months postoperatively without pain, which resolved within two months without intervention. A computed tomographic (CT) scan 18 months postoperatively showed complete filling of the pinholes but some asymmetry of the condylar neck, with the treated side looking wider. At four years' follow up he had normal dietary function with no pain, and there was 45 mm mouth opening with no deviation. Between 24 and 44 months postoperatively some asymmetry in growth was noted (during his growth spurt, age 15-17 years), but it does not concern the patient.

### *Case 3*

A 6-year-old girl presented after falling from her scooter with mouth opening of 30 mm, deviation to the left, and pain in the region of the left TMJ. On occlusion she made early contact on the left side but could not achieve centric occlusion. The radiographs showed a fracture of the condylar base that deviated medially at 85°, with medial dislocation of the condylar head and shortening of 7 mm. She had open reduction of the condyle and internal fixation with a sonic sheet and pins (Fig. 2). At two-year review she had no pain and normal dietary function. She had good mouth opening (45 mm) with minimal deviation to the left and symmetrical lateral excursions. There was no evidence of growth disturbance. CT scan at 24 months showed complete bony infill of the resorbable pin sites.

### *Case 4*

A 15-year-old boy presented after a road traffic collision with a comminuted fracture of the right condylar neck. On examination he had pain and swelling in the region of the right TMJ associated with a malocclusion. Radiographs showed a comminuted fracture of the right condylar neck and head. He was treated with open reduction of the condyle and internal fixation with a sonic sheet and pins. Longer pins were used to secure the condylar head component (Fig. 3). At two-year follow up he had normal dietary function and no pain. There was no evidence of growth disturbance of the mandible and interincisal opening was 50 mm. He failed to attend for further follow up.

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