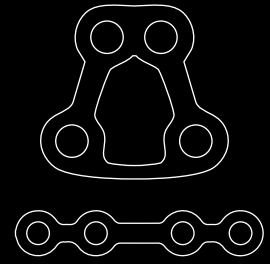


## CASE REPORT



# Fixation of left condylar head fracture, right condylar base fracture, and mandibular symphyseal fracture with MODUS 2.0

## The Surgeon

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Dr. Louvrier is a specialist in the department of maxillofacial surgery headed by Pr. Christophe Meyer. This department is specialized in the surgical management of condylar fractures. Due to his expertise in this field, he is a speaker and instructor at national and international congresses, workshops and courses.

## Introduction

Fractures of the condylar region are frequent. Depending on the fragment size and dislocation, surgery can be indicated. Several surgical treatment options and internal fixations have been tried during the past decades. Osteosynthesis of a condylar head fracture using compression screw fixation and osteosynthesis of a condylar base fracture using a 4-hole TCP plate will be presented. The two fractures were accompanied by a symphysis fracture.

## The Case



### Patient Profile

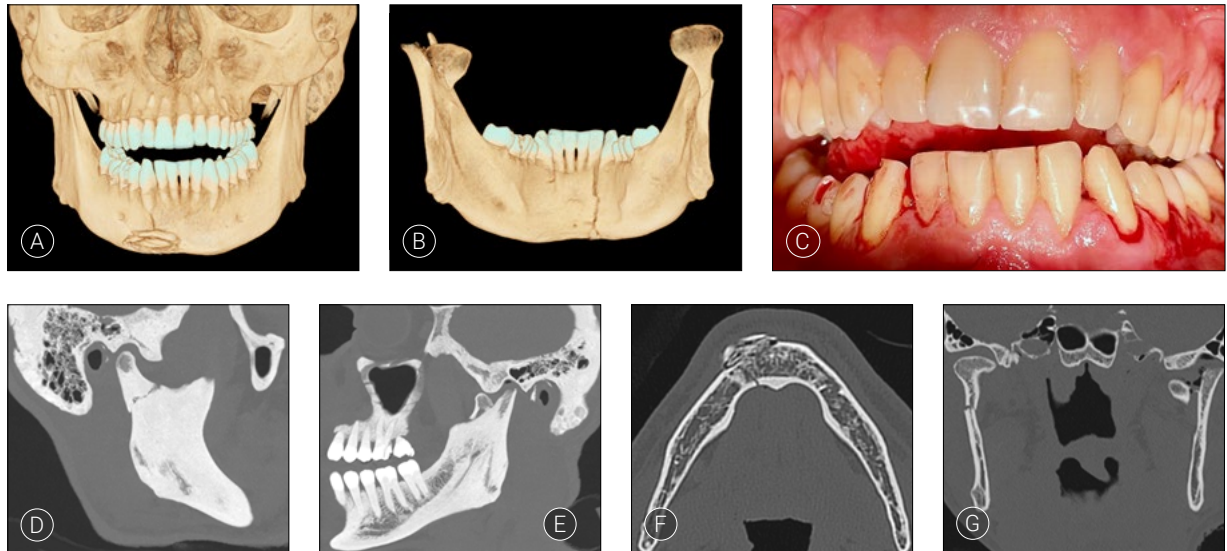
A 29-year-old man became unconscious and fell to the ground.

His chin hit the ground hard. His medical history showed no preexisting medical conditions.



### Clinical Findings / Preoperative Analysis

The clinical examination presented a wound of the chin, a limitation of mouth opening, a dental occlusion disorder (anterior and right open-bite) and pain in the two condylar regions of the mandible. The CT scan showed a displaced fracture of the left condylar head, a displaced fracture of the base of the right condyle, and a fracture of the symphyseal region passing between teeth 42 and 43 with focal comminution (Figure 1).

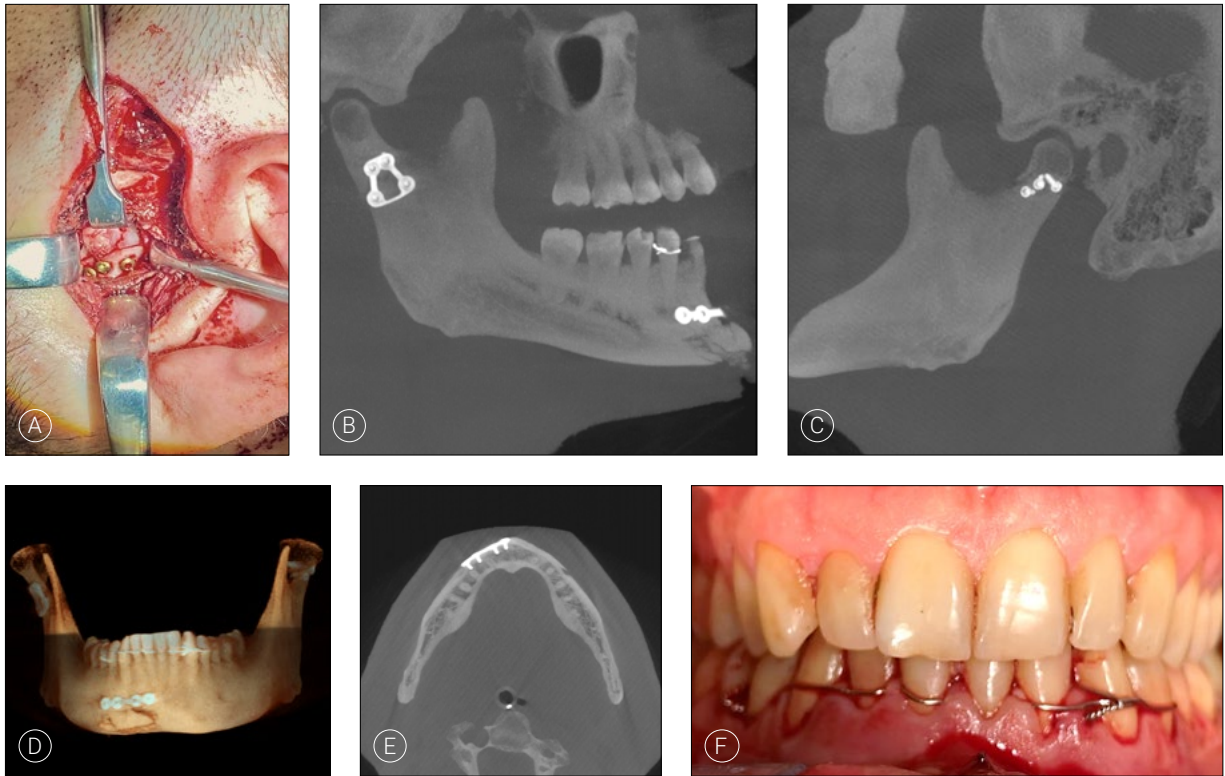


**Figure 1.** Preoperative analysis. **A.** Preoperative CT-scan, anterior view of a 3D reconstruction showing a symphyseal fracture passing through the alveolus of tooth no. 43 and a comminution of the basilar region. **B.** Preoperative CT-scan, posterior view of a 3D reconstruction showing a symphyseal fracture passing through the alveolus of tooth no. 43, a displaced left condylar head fracture and a displaced right condylar base fracture. **C.** Preoperative view of the dental occlusion showing an anterior and right open bite. **D.** Preoperative CT-scan, sagittal reconstruction showing a displaced right condylar base fracture. **E.** Preoperative CT-scan, sagittal reconstruction showing a displaced left condylar head fracture. **F.** Preoperative CT-scan, axial view showing a right symphyseal fracture with focal comminution of the basilar region. **G.** Preoperative CT-scan, frontal reconstruction showing a displaced left condylar head fracture and a displaced right condylar base fracture.



### Surgical treatment

Surgery was performed on the same day as the trauma. Under general anesthesia and nasotracheal intubation, we performed an interdental ligature around the teeth opposite the symphyseal fracture (41, 42, 43, and 44). A high submandibular approach was chosen on the right side and internal fixation was carried out using a TCP plate with four 2.0 screws of 5 mm length. A preauricular approach was preferred on the left side and, after the reduction of the fracture, internal fixation by lag screw was carried out using three 2.0 screws of 7, 9 and 11 mm in length. To preserve the small bone fragments of the chin region, only an additional 4-holes plate was implanted on the symphyseal region using a classical vestibular approach and fixed with four 2.0 screws of 5 mm length. For the stability of the symphyseal fracture, the interdental ligature was left in place because a single plate is usually not sufficient. An intraoperative cone-beam computer tomography was performed to check the anatomic reduction and the correct position of the plates and screws (Figure 2). After checking the correct dental occlusion, closure was performed on suction drains.



**Figure 2.** Surgical treatment. **A.** Intraoperative view showing an anatomic reduction of the left condylar head fracture and the fixation with three 2.0 lag screws by a preauricular approach. **B.** Intraoperative CBCT, sagittal reconstruction showing an anatomic reduction of the right condylar base fracture and the fixation with a 4-hole TCP plate with four 2.0 screws. **C.** Intraoperative CBCT, sagittal reconstruction showing an anatomic reduction of the left condylar head fracture and the fixation with three 2.0 lag screws. **D.** Intraoperative CBCT, anterior view of a 3D reconstruction showing an anatomic reduction of the right symphyseal fracture and the fixation with a 4-holes plate with four 2.0 screws and an interdental ligature. **E.** Intraoperative CBCT, axial reconstruction showing an anatomic reduction of the right symphyseal fracture and the fixation with a 4-hole plate with four 2.0 screws. **F.** Intraoperative view of the dental occlusion.



### Postoperative treatment

An orthopantomogram was obtained on the first day after surgery. The drains were removed 2 days after surgery. The patient did not have a maxillo-mandibular fixation. A mixed diet was prescribed for 6 weeks. Physiotherapy was prescribed 4 weeks after surgery. Interdental ligatures were removed 8 weeks after surgery. Two months after the surgery, the patient was pain-free, had regained subnormal mandibular function (mouth opening = 37mm), and had resumed a normal diet. Follow-up radiographs (2-months) revealed an anatomical union of the fractures (Figure 3). Normal mandibular function is usually restored 3 to 4 months after surgery with physiotherapy and the resumption of a normal diet. We do not recommend removing the plates and screws from the condylar region but the removal is proposed for the symphyseal region 8 months after the surgery.



**Figure 3.** Postoperative findings (2-month follow-up). **A.** Orthopantomogram showing no postoperative displacement of bone fragments or osteosynthesis material. **B.** Postoperative view of the dental occlusion after removal of the interdental ligature. **C.** Postoperative mouth opening before completing physiotherapy.



### Conclusion

Open reduction and internal fixation of condylar fractures is a safe surgical treatment with a low complication rate and a predictable morphological and functional outcome. The MODUS 2.0 range is perfectly suited for traumatic surgery of mandibular fractures.



### References

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