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Case Report

Extra-articular ankylosis after zygoma fracture; A case report & review of literature

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ABSTRACT

Extra-articular temporomandibular bony ankylosis between the coronoid process and the zygoma is quite uncommon. In this paper we present a case of fusion of the left coronoid to the zygomatic bone in a 23-year-old male. This bony ankylosis was the result of five-week-old untreated zygomatic complex fracture. Ankylosis developed secondary to heterotopic bone formation following trauma. Zygomatico-coronoid ankylosis of the mandible is a complication which rarely occurs if fractures of the middle third of the facial skeleton have been adequately treated. The patient was treated by intraoral coronoidectomy. The rationale for clinical and radiographic diagnosis and treatment is reviewed.

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1. Introduction

Fibrous or bony adhesion between the coronoid process and the zygoma is a rare cause of extracapsular ankylosis. It may follow facial fractures caused by gunshots,¹ treated and untreated fractures of the zygomatic complex^{2–4} with or without concomitant fracture of the coronoid process, chemical burns,⁵ mandibular fractures,⁶ infections involving the infratemporal space,⁷ local surgical complications^{2,8,9}, and extension of intracapsular ankylosis.⁹

The mechanisms by which the ankylosis develops are unclear, since heterotopic bone is rarely encountered in the maxillofacial region. It may result from metaplastic changes in connective tissue elements that do not ordinarily have osteogenic potential, following trauma, infection or surgery. Histological examination generally reveals proliferating connective tissue with fibroblasts in transition to osteoblasts and areas of cartilage, osteoid and bone.⁸

It is generally agreed that an effective treatment for extra-articular ankylosis may be coronoidectomy and excision of scar tissue. But some author say that these conventional procedures have shown a high rate of recurrence of ankylosis due to heterotopic bone and fibrous tissue formation, so they have used a coronoid osteotomy and insertion of a free abdominal flap.¹⁰ The prophylactic physiotherapy is important in both the post-accident and the post-corrective-operation period.

2. Case report

A 23-year-old male was referred to our department with a painless, but progressively limited mouth opening. He was the victim of a motorcycle accident 5 weeks before, sustaining trauma to the left side of the face. Previous medical and surgical history and review of systems were non-contributory. Extraoral examination showed no visible depression in the

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left zygomatic region. There was no evidence of scarring, diplopia or infraorbital paresthesia.

Interincisal mouth opening was just 1 mm (Fig. 1a). There was inability to perform protrusive or lateral jaw movements. On condylar palpation, no rotary or translatory movement was discernible on the left side. Intraoral examination showed a stable occlusion and no further abnormalities.

Radiographic examination with 3D computerized tomography showed loss of normal architecture of the coronoid process on the left side (Fig. 2). An axial cut of computerized tomography (CT) scan demonstrated a bony mass connecting the zygomatic arch and the coronoid process on the left side without capsular involvement. Fracture lines in CT suggested a previously undetected, multifragmented zygomatic fracture.

The patient was taken to the operating room and a nasal intubation was performed. The left coronoid process was exposed through an intraoral incision, extending from external oblique ridge to anterior border of mandible & upto coronoid process. Coronoid process was found to be fused with zygomatic arch. The temporomandibular joint was not affected. A fissure burr was used to separate the left coronoid process from the ramus. Further separation of the coronoid process from the inner aspect of the zygoma was achieved by means of an osteotome. The mass of bone & coronoid process attached to the zygoma was removed. Following this procedure, the patient's interincisal opening was 33 mm. The patient was started on physiotherapy one day after surgery and was discharged with an interincisal opening of 32 mm after 5 days. Patient was advised to continue physiotherapy. After six month, the interincisal opening was stable around 31 mm (Fig. 1b). Mandibular function was adequate and protrusive and lateral movements of the jaw were restored.

3. Discussion

Adhesion between the coronoid process and the zygoma is a rare. It may follow facial fractures caused by gunshots,¹ treated and untreated fractures of the zygomatic complex^{2–4} with or without concomitant fracture of the coronoid process, chemical burns,⁵ mandibular fractures,⁶ infections

Fig. 2 – Pre-operative 3D-CT.

involving the infratemporal space,⁷ local surgical complications^{2,8,9}, and extension of intracapsular ankylosis.⁹

Mechanisms of development of ankylosis are unclear, since heterotopic bone is rarely encountered in the maxillo-facial region. Perhaps it results from metaplastic changes in connective tissue elements that do not ordinarily have osteogenic potential, following trauma, infection or surgery. Histological examination reveals proliferating connective tissue with fibroblasts in transition to osteoblasts and areas of cartilage, osteoid and bone.⁸

Most authors agree that the only possible treatment for this condition is a coronoidectomy.

There is a diversity of opinion as to whether the coronoidectomy should be performed intraorally or extraorally. Intraorally, there is no scar mark on face and no facial nerve injury, but access is difficult. Extraorally coronal approach gives good access, but approach is less esthetic and there are always chances of facial nerve injury. In isolated fresh fractures of zygoma with little bony mass between zygoma

Fig. 1 – Pre-operative & six-month post-operative mouth opening.

and coronoid, intraoral approach is best. In case of coexisting midfacial fractures and large bony mass between zygoma and coronoid process, the coronal approach seemed to be the best choice, as access to the affected site is excellent and sufficient removal of coronoid bone is possible.

Some author say that these conventional procedures have shown a high rate of recurrence of ankylosis due to heterotopic bone and fibrous tissue formation, so they have used a coronoid osteotomy and insertion of a free abdominal flap.¹⁰

Early postoperative opening exercise,^{2,8} a strict follow-up and even forceful opening are essential to overcome post-operative adhesions that might develop.

Conflicts of interest

All authors have none to declare.

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