Case Report

Extradural Hematoma Following Temporomandibular Joint Interposition Arthroplasty

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Abstract

We describe a case of a 17-year-old male who remained drowsy following left temporomandibular joint (TMJ) interposition arthroplasty for TMJ ankylosis. Computed tomography of the head demonstrated an extradural hematoma. The possible cause of this unusual occurrence is discussed.

Keywords: Extradural hematoma, temporomandibular joint, temporomandibular joint interposition arthroplasty

INTRODUCTION

The temporomandibular joint (TMJ) is composed of the temporal bone above and the condyle of mandible below, as well as a specialized dense fibrous structure, the articular disk. TMJ ankylosis is a fusion of these joint surfaces. TMJ ankylosis is classified into true or intra-articular type and false or extra-articular type. Intra-articular ankylosis most commonly occurs after trauma or infection, whereas extra-articular type can occur by a large variety of disorders including myogenic, neurogenic, inflammatory processes and bone and soft-tissue tumors. This condition can lead to chewing, digestion, speech, esthetic, and oral hygiene problems. When this occurs during the growing period, it leads to varying degrees of facial deformity and psychological problems.

Various procedures have been described for the treatment of TMJ ankylosis in the literature. These include gap arthroplasty, interposition arthroplasty, and total joint reconstruction using alloplastic or autogenous materials. Since 1893, interposition arthroplasty has been an advocated treatment method, in which an autogenous tissue or alloplastic material is inserted into the gap, separating the bone ends. In our hospital, interposition arthroplasty is the procedure being followed by the surgeons.

Complications after TMJ interposition arthroplasty are uncommon. They are usually mild and transient such as infection, reankylosis, and hemorrhage. They are rarely life-threatening.

Intracranial complications resulting from TMJ arthroscopy/arthrocentesis have been reported earlier, but no such complication has been reported after TMJ interposition arthroplasty. One case was of chronic extradural hematoma (EDH) which was diagnosed at 17 days post-TMJ arthroscopy. The second case was a 59-year-old woman who remained drowsy and developed left hemiparesis following right TMJ arthrocentesis and lavage for TMJ dysfunction. Computed tomography (CT) demonstrated an EDH which was evacuated and patient recovered.

In this case report, we describe a patient developing EDH following interposition arthroplasty of the TMJ. This unusual occurrence has not been reported earlier.

CASE REPORT

A 17-year-old male patient with a history of road traffic accident at 4 years of age was presented with left TMJ ankylosis. Preoperative CT showed an old fracture of mandibular condyle with sequelae of arthritis in the left TMJ. Left TMJ interposition arthroplasty was planned. Since

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Patient’s mouth opening was nil, an awake nasal fiberoptic intubation was planned. In operating room, monitors for electrocardiogram, heart rate, noninvasive blood pressure, and SpO₂ were connected. Injection midazolam 0.02 mg/kg and fentanyl 1 μg/kg intravenous (IV) were given. Awake right nasal fiberoptic intubation was done with cuffed endotracheal tube number 7.0 mm i.d. Bilateral air entry was checked and confirmed by the appearance of capnograph. Injection propofol 2 mg/kg IV, injection vecuronium 0.1 mg/kg IV, and injection morphine 0.1 mg/kg IV were given. The patient was put on mechanical ventilation on volume control mode.

Maintenance of anesthesia was done with oxygen, nitrous oxide, isoflurane, and vecuronium. Intraoperatively, the patient remained hemodynamically stable in 4 h of surgery.

At the end of procedure, neuromuscular blockade was reversed with 0.05 mg/kg of injection neostigmine and 0.01 mg/kg of injection glycopyrrolate IV after spontaneous respiratory efforts. Motor power was good and the patient was breathing adequately. However, he was not responding to verbal commands. After 20 min of inability of patient to regain consciousness, bilateral pupils were checked. Right pupil was of normal size, normal reaction. Left pupil was mid-dilated, sluggishly responding to light. Vitals were stable, and Glasgow Coma Scale (GCS) was E1VtM6. Blood sugar was normal. An arterial blood gas analysis was done and was within normal limits. The patient was normothermic. Pupils were again checked after 20 min which showed further dilatation of the left pupil while the right pupil was of normal size and reaction. There was soaking of dressing over the left ear with serosanguinous discharge. Provisional diagnosis of cerebrospinal fluid (CSF) otorrhea was made. Noncontrast CT of the head was done which revealed EDH on the left parietotemporal region with maximum convexity of 3 cm with midline shift of 9 mm. The presence of soft tissue in the left external, middle ear, mastoid ear cells, and fracture of tegmen tympani are seen in Figure 1.

Neurosurgery opinion was sought and emergency craniotomy was planned. EDH was evacuated and the patient was shifted to the Intensive Care Unit (ICU) for elective ventilation. On postoperative day 1, patient’s GCS was E4VtM6 and was extubated. For persistent CSF otorrhea, lumbar drain was inserted. On postoperative day 2, the patient started responding to verbal commands. On postoperative day 4, lumbar drain was removed. The patient was discharged from the ICU on the 4th postoperative day with GCS 15/15.

Discussion

Complications after TMJ interposition arthroplasty are uncommon. They are usually mild and transient. General complications such as infection, reankylosis, and hemorrhage have been reported. They are rarely life-threatening.

Because TMJ ankylosis may result in significant health problems, especially in children, early treatment is recommended. If not promptly corrected before 6 years of age, TMJ ankylosis may result in disturbance of the growth of the mandible with resulting permanent deformity. Inability to open the mouth due to ankylosis predisposes the patient to dental caries. In advanced stages, due to intake of only semi-solid diet, nutrition is affected.

The three main approaches to surgical treatment of TMJ ankylosis are gap arthroplasty, interposition arthroplasty, and joint reconstruction. Gap arthroplasty is probably the least complex. In this procedure, the area of ankylosis is resected and a gap is left between the upper and lower portions of the mandible. The ankylosis may, however, recur and bridge the gap. In interposition arthroplasty, the gap is filled with a foreign material to prevent the two parts of the mandible from growing together again. In joint reconstruction, all abnormal soft tissue and bone are removed and replaced with a bone graft or prosthetic device. In our hospital, mainly interposition arthroplasty is done using temporoparietal fascial flap although alloplastic materials have also been used.

Vascular injuries have been described in superficial vessels but not in relation to deep vessels such as pterygoid plexus, maxillary artery, and internal carotid artery, although these have also been mentioned as being potentially at risk because of their anatomic position with respect to the joint.⁹

EDH occurs in <2% of patients with head injuries. The middle meningeal artery has been implicated in over 50% of cases and the vein in <30% and in the residual 20%; venous bleeding from either diploic veins or tears in dural sinuses has been cited. The hematoma is frequently associated with an overlying fracture and is most commonly seen in the temporal region. The CT

Figure 1: Computed tomography showing the patient’s left-sided extradural hematoma
scan appearance is that of a lenticular hypodense extra-axial collection instead of the hyperdense appearance associated with a fresh clot. The hematomas is readily evacuated via Burr holes.

The underlying pathogenesis of the EDH in this case was probably transarticular puncture of the thin temporal fossa floor during osteotomy. This could have cause direct dural vessel injury. The temporal bone forms the floor of the middle cranial fossa, and hence, the rent in the temporal bone caused rupture of the middle meningeal vessels leading to EDH. Furthermore, the fracture of tegmen tympani during osteotomy resulted in CSF otorrhea.

This case report highlights that although majority of TMJ surgeries are uncomplicated if a patient remains drowsy following the procedure when all other causes of delayed recovery are ruled out, the possibility of an intracranial event should be considered. Checking the pupillary size and reaction for lateralizing sign and imaging studies of the head help in confirming the diagnosis aiding prompt intervention.

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Conflicts of interest
There are no conflicts of interest.

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