Fibrous ankylosis of the mandible following frontotemporal craniotomy

Case report


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A case of fibrous ankylosis of the mandible secondary to frontotemporal craniotomy is reported. The pathogenic, clinical, and therapeutic aspects of the case are discussed.

KEY WORDS: ankylosis, trismus, frontotemporal craniotomy, mandible, jaw

MANDIBULAR hypomobility may be the result of a number of conditions. Chronic, persistent inability to open the mouth resulting from pathological involvement of the temporomandibular joint has been referred to as true ankylosis. False ankylosis is the result of extraarticular abnormalities that produce persistent limitation of jaw movement. Trismus is generally defined as a temporary inability to open the mouth as a result of muscular or neuromuscular pathology.

Access to the cranium for neurosurgical procedures frequently requires transection of the temporalis fascia and muscle. A potential complication of such procedures is severe limitation of mandibular opening as a result of fibrosis of the temporalis muscle. A case of extra-articular ankylosis following frontotemporal craniotomy is presented, in which treatment by coronoidectomy has yielded satisfactory results.

Case Report

This 31-year-old left-handed woman was seen in the emergency room after she developed sudden onset of severe headache, stiff neck, dizziness, and nausea. Lumbar puncture showed an opening pressure of 285 mm H2O with grossly bloody cerebrospinal fluid. Cerebral arteriography demonstrated a right-sided posterior communicating artery aneurysm. Operation was performed through a frontotemporal scalp flap. The temporalis fascia and muscle were incised using a modification of the flap described by Yaşargil, et al. A moderate-sized craniotomy was performed and the aneurysm was clipped. The patient tolerated the procedure well, and had an unremarkable postoperative course.

Approximately 6 weeks later, the patient presented to the oral and maxillofacial surgery department for evaluation of limited mandibular opening which had progressed gradually over a period of 1 month. Physical examination was normal except for a maximum mandibular opening of 5 mm (normal is approximately 3.5 cm), with deviation to the right side. Multiple radiographic procedures failed to disclose joint pathology, or impingement of the coronoid process of the mandible on the zygomatic arch.

First Admission. In the operating room the patient was sedated, and blind nasoendotracheal intubation was performed. General anesthesia was administered, and complete relaxation was obtained with administration of curare. Manipulation of the patient's mandible at this time failed to achieve a greater range of motion. Wooden tongue blades were then wedged between the patient's maxillary and mandibular teeth until there was sufficient room to admit a Molt sidergag rachet mouth prop. With a mouth prop placed on each side of the mandible, continuous force was applied, and maximum opening was attained. This was coincident with an audible deep tearing sound from the patient's temporal region. The mandible was then exercised by numerous manual opening and closing movements, and left propped in a maximally opened position for 10 minutes. Anesthesia was terminated and the patient was taken to the recovery room in
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good condition. The evening after surgery the patient was able to open her mouth 2.5 cm without mandibular deviation. She was then given instructions in using tongue-blade stretch exercises and was discharged from the hospital. When she was seen in the office 6 days later, she was able to open her mouth 3 cm with minimal right-sided deviation.

Tongue-blade stretch exercises were continued on a schedule of two times daily for 1 week. The patient was able to maintain a regular diet and was without complaints. She was followed at monthly intervals. After 2 to 3 months, gradual reduction in mandibular opening was noted, and at 5 months, maximum opening was only 2 cm with right-sided deviation. The patient was then readmitted for intraoral right-sided coronoidectomy.

Second Admission. With the patient under general anesthesia, an unsuccessful attempt was made to produce greater mouth opening using mouth props. The coronoid process was then sectioned from the mandibular ramus. The temporalis muscle attachment was stripped, and the bone fragment removed. The patient tolerated the procedure well and was able to return to normal function within 7 to 10 days. Maximum mandibular opening reached 3.5 cm without deviation. Follow-up examination showed no return of trismus after 6 months.

Discussion

Pain and trismus are part of the usual postoperative course in patients who have had surgery in the temporal fossa. These symptoms normally resolve over the first 3 to 4 weeks following surgery as the patients return to normal mandibular function. Reluctance on the part of patients to return to normal diet and function because of pain, swelling, and muscle stiffness in the surgical area predisposes to progressive and persistent limitation of mouth opening. In addition to being encouraged to return to normal diet and function as soon as possible, patients should be instructed in mouth opening exercises, such as slowly wedging several flat wooden tongue blades between the posterior teeth on the affected side, and opening the mouth as widely as possible against resistance by placing a fist below the chin. These exercises should be performed for 10 minutes, twice a day, for approximately 4 weeks. Moist heat and mild analgesics are useful in treating the muscle pain incurred during chewing and opening exercises.

The exact mechanism creating ankylosis after surgery in this case is not understood. The temporalis is a multipinnate muscle in which long bands of fibrous tendon are interrupted by relatively short bands of muscle fibers. It may be that contraction of cicatrix formed by incising perpendicularly to the long axis of these muscle fibers reduces muscle length sufficiently to inhibit the mandible from obtaining maximum opening. Scarring or fibrosis of the temporalis muscle has been implicated as the mechanism causing ankylosis in other reported cases.4-6 Because ankylosis of the mandible following neurosurgical procedures is rare, additional explanations clarifying its occurrence in isolated cases must be attempted. In the case presented here, it was noted during surgery that considerable amounts of scar tissue occupied the temporal fossa in the area of the coronoid process. It is our belief that reflection of the temporal flap too far inferiorly may cause hemorrhage into the infratemporal fossa, creating subsequent fibrosis. Damage to blood vessels and muscle in this area may be incurred if retractors are allowed to slip inferiorly into the area of the coronoid process.

Previously reported cases have been treated by coronoidectomy with good results. Coronoidectomy is a relatively benign procedure and may be accomplished via an intraoral approach. In patients with severe trismus, however, an extroral approach must be taken in order to obtain adequate surgical access to the coronoid process.

The authors are aware of one unpublished case of ankylosis of the mandible which was unsuccessfully treated by detaching the temporalis muscle fibers from the mandible without removing the coronoid process. Although the patient's condition improved temporarily, ankylosis recurred with time. Given this case, and the fact that our patient did not achieve satisfactory results following conservative treatment (forced opening of the mandible), it seems the coronoidectomy is the treatment of choice in cases of fibrous ankylosis of the mandible following surgical procedures that interrupt the temporalis muscle.

References


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