Case Report / Olgu Sunumu

Inappropriate use of foreign materials in temporomandibular joint ankylosis surgery: report of two cases

Temporomandibüler eklem ankilozu cerrahisinde yabancı maddelerin uygun olmayan kullanımı: İki olgu sunumu

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Gap and interpositional arthroplasties are the most commonly used methods in the treatment of temporomandibular joint ankylosis. Complete resection of ankylotic segments, fibrotic band release and creating gap between the condyle and the glenoid fossa have great importance. Two patients were admitted to our clinic with complaints of difficulty in opening mouth and joint pain. In physical examination, maximum mouth opening values were recorded as 7 mm in one patient and 9 mm in another. An operation was planned due the presence of radiological grade 4 bilateral bony ankylosis. During the operation, foreign materials were found in the joint spaces of the patients. The first patient had a piece of nylon bag in the joint space, whereas the second patient had a silicon sheath used for wound therapy. Following removal of these materials, as a result of the recreation of joint spaces and the placement of suitable silicon blocks, 32 and 34 mm of mouth openings were noted during follow-up. In conclusion, recreated temporomandibular joint spaces after ankylosis surgery may be filled with a variety of autogenous or non-autogenously materials. However, the use of wrong materials inevitably causes recurrence and even worsens the primary condition.

Key Words: Interpositional arthroplasty; reankylosis; temporomandibular ankylosis.

Gap ve interpozisyonel artroplasti, temporomandibüler eklem ankilozunun tedavisinde en sık kullanılan yöntemlerdir. Ankilotik parçaların tam çıkarılması, fibrotik bantların uzaklaştırılması ve beraberinde kondil ile glenoid fossa arasında eklem açıklığı yaratmak çok önemlidir. İki hasta ağız açmakta zorluk ve çene ekleminde ağrı yakınması ile kliniğimize başvurdu. Fizik muayenede ağız açıklığı bir hastada en fazla 7 mm, diğerinde ise 9 mm olarak kaydedildi. Radyolojik olarak derece 4 iki taraflı kemik ankilozu varlığı nedeni ile ameliyat planlandı. Ameliyat sırasında hastaların eklem boşluklarında yabancı materyaller saptandı. İlk hastanın eklem boşluğunda naylon poşet parçası, ikincisinde ise yara tedavisi için kullanılan silikon örtü vardı. Bu materyallerin çıkarılmasını takiben, gerekli eklem boşluğunun yaratılması ve uygun silikon blokların yerleştirilmesi sonucunda, geç dönemde ağız açıklıkları 32 ve 34 mm olarak kaydedildi. Sonuç olarak, ankiloz cerrahisi sonrası yeniden oluşturulan temporomandibüler eklem boşluğu otojen veya otojen olmayan çeşitli materyallerle doldurulabilir. Ancak yanlış materyal kullanımı, kaçınılmaz şekilde nükse neden olur ve hatta asıl durumu kötüleştirir.

Anahtar Sözcükler: İnterpozisyonel artroplasti; reankiloz; temporomandibüler eklem ankilozu.

Temporomandibular joint (TMJ) ankylosis is the hypomobilization or immobilization of the mandibular condyle in the glenoid fossa due to union of mandibular condyle, disc and temporal glenoid fossa.[1] Because of decreased mouth opening, patients experience problems of mastication, digestion, speech and oral hygiene.[2] Treatment is difficult and challenging. Though

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Figure 1. *A piece of nylon sheath was removed in Case 1.*

there are many surgical procedures for TMJ ankylosis, the main purpose is the adequate excision of involved structures, with or without immediate reconstruction by the interposition of autogenous or alloplastic materials to enable sufficent mouth opening.[3] The gap may be filled with a variety of materials. According to the chosen time of reconstruction, autogenious materials such as costochondral graft,[4] metatarsal head, sternoclavicular joint,[5] dermis graft,[6] temporal fascia flap,[7] alloplastic silastic tubes[8,9] and protheses[10] might be used. The chosen material should have adequate width and height. It must also prevent contact of the mandibular condyle and glenoid fossa and permit early jaw exercise therapy. However the wrong choice of materials inevitably causes recurrent ankylosis. In this article we report two cases of recurrent grade 4 bony ankylosis cases due to wrong material usage in previous operations.

CASE REPORT

Case 1– A 18-year-old woman patient was admitted to our clinic because of limitation of mouth opening. Preoperative assessment included a thorough history, physical examination and radiographic examination that included panoramic radiographs and axial computed tomography (CT). History revealed trauma to the chin and progressive development of ankylosis following that trauma. A gap arthroplasty was performed three-years prior to admission to our clinic. On physical examination, maximal mouth opening was 7 mm and facial asymmetry was documented. Bilateral grade 4 bony ankylosis from the glenoid fossa extending to the zygomatic arch was seen in axial CT scans.

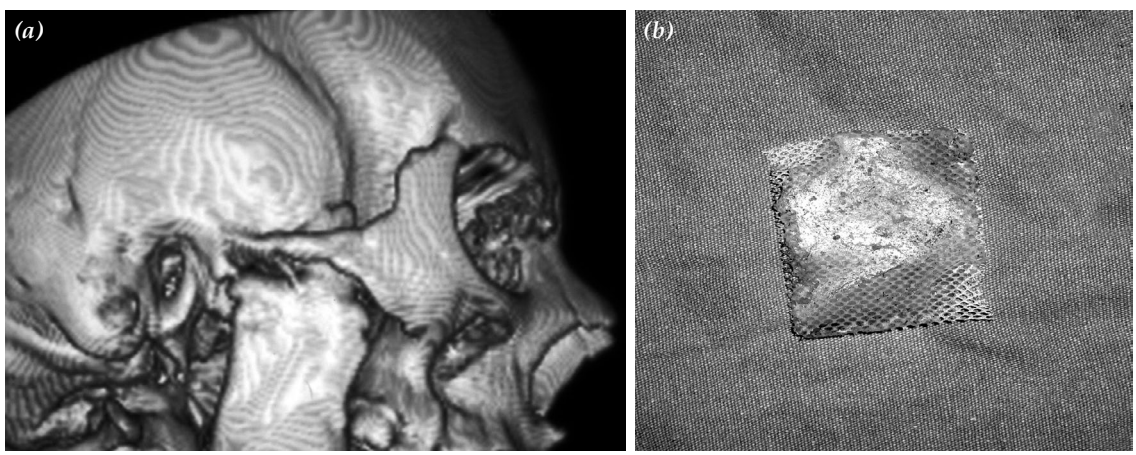

Figure 2. ***(a)*** *Computed tomographic view of grade 4 bony ankylosis observed in case 2. Note the coronoid process has become united to the temporal fossa,* ***(b)*** *a piece of silicon sheath was removed.*

Case 2– A 36-year-old man patient was admitted due to difficulty in mouth opening. The patient's history revealed bilateral untreated condylar fractures after falling from the first floor. A gap arthroplasty was performed six years ago. On physical examination maximal mouth opening was 9 mm. A hypoplastic mandibule was documented. Again bilateral grade 4 bony ankylosis was seen in axial CT scans.

In both cases, intraoral and extraoral combined approaches were used. A pre-auricular incision was made to reach the temporalis fascia. Temporalis fascia was split and the fascia flap was reflected. Subperiostal dissection was extended to the zygomatic arch to visualize the anterior border of the ankylosis. The ankylotic segment was removed and a coronoidectomy was performed. A nylon bag was found between the glenoid fossa and the mandibular condyle in the first case (Figure 1) whereas a thin silicon sheet was found in the second case (Figure 2). Both materials were not thick and strong enough to bear the articular forces. Following ankylotic segment and inconvenient material removal, thick silicon blocks, which filled the joint space and covered the mandibule, were placed. A passive inter-incisial mouth opening of 32 mm in case 1, and 34 mm in case 2 were seen intraoperatively. After six-month follow-up, maximal interincisial mouth openings of 37 mm in case 1 and 39 mm in case 2 were achieved.

DISCUSSION

Temporomandibular joint ankylosis is a challenging entity for surgeons and its treatment is not always successful. A variety of surgical procedures are available to correct the condyle-glenoid relation and to provide mouth opening. Gap arthroplasty and interpositional arthroplasty are the basic surgical options.[11] In the literature, no superiority is reported between these procedures.[12] The main purpose of treatment is the appropriate resection of the ankylotic segment and the release of soft tissues around the joint. After reaching adequate mouth opening, the most important part is preventing contact between the bony segments.[13]

Gap arthroplasty is one of the mostly used surgical procedures. After resection of the ankylotic part, a gap which must be more than 15 mm is created between the glenoid fossa and condyle. Following this, soft-tissue release and ipsilateral coronoidectomy is performed if necessary.[2] The gap provides free movement of the mandible and may prevent callus formation and recurrence. Although it is a simple and faster operation than the other alternatives, shortening of the ramus and open-bite deformity development are the disadvantages.[13]

In interpositional arthroplasty after bony segment resection the gap between condyle and glenoid fossa is filled with autogenous or alloplastic material. The material covers the mandibular condyle like a disc and prevents callus formation. The selection of material is important. Autogenous tissue like dermis, fascia, muscle or chondral tissue and other materials like alloplastic acrylic silicon may be used. Silicone has been used for many years and many authors trust its usage in arthroplasty. Silicone is applied as a sheet or as a block according to the height of the ramus.[14] However, in the two cases presented, we observed usage of two unsuitable materials: a silicon sheet used normally in hypertrophic scars and a nylon bag which has no role in medical treatment at all.

In conclusion, materials used during interpositional arthroplasty should have certain properties. They have to be strong enough to bear the loading forces of articular surfaces and should permit free mandibular motion. They should cause minimal foreign body reactions and must be suitable for in vivo usage. The use of wrong materials inevitably causes recurrence. As seen in our cases, the placement of a piece of a nylon bag and a silicon sheet did not prevent reconnection and also likely provoked foreign body reactions, which probably worsened the situation.

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