

A Rare Complication with Beach Chair Positioning During Shoulder Surgery

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Abstract

Aim: Shoulder arthroscopy in the beach chair position for treatment of shoulder pathologies is a widely used procedure. In recent literature, complications because of the positioning under general anesthesia have been reported. The objective of this study is to report a case of greater auricular nerve neuropraxia after shoulder arthroscopy.

Method: A 32 old male patient has visited our clinic and based on symptoms, physical examination and screening; an operation has been planned with the diagnosis of Bankart lesion. The surgery was performed under general anesthesia. Endotracheal intubation was performed to the patient in the beach chair position. The patient felt dysesthesia and numbness at the middle and lower third of the posterior facade of his left auricle. EMG study revealed neuropraxia in the greater auricular nerve (GAN). Symptoms have started to recover after two weeks postoperatively and resolved completely by 6 weeks.

Results: In recent literature, there is a restricted amount of cases about GAN neuropraxia. We recommend that special care should be taken to the head and cervical region with extra padding of the headrest or using a horseshoe headrest to minimize the compression over the cervical plexus and auricular region. To our knowledge in the first case report in Turkey, neuropraxia in the posterior branch of GAN developed, which was confirmed with EMG.

Conclusion: The present case aims to raise awareness regarding this rare complication. We think that new materials for beach chair positioning are needed to be produced and used to prevent or diminish complications.

Keywords: Neuropathology, shoulder, arthroscopy, patient positioning.

Olgu Sunumu (Case Report)

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Omuz Cerrahisi Sırasında Plaj Sandalyesi Pozisyonunda Nadir Görülen Bir Komplikasyon

Öz

Amaç: Plaj sandalyesi pozisyonunda omuz patolojilerinin tedavisinde omuz artroskopisi yaygın olarak kullanılan bir işlemdir. Son literatürde genel anestezi altında pozisyon verilmesine bağlı komplikasyonlar bildirilmiştir. Bu çalışmanın amacı, omuz artroskopisi sonrası gelişen büyük auriküler sinir nöropraksisi olgusunu bildirmektir.

Yöntem: 32 yaşında erkek hasta kliniğimize başvurmuş olup semptomlar, fizik muayene ve tarama sonucunda; Bankart lezyonu ön tanısı ile operasyon planlanmıştır. Hastaya genel anestezi altında plaj sandalyesi pozisyonunda endotrakeal entübasyon ile cerrahi uygulanmıştır. Sol kulak, kulak kepçesinin arka yüzünün alt ve orta 1/3'ünde uyuşma ve disestezi şikayeti ile başvurmuştur. EMG çalışmasında büyük auriküler sinirinde (GAN) nöropraksi ortaya çıkmıştır. Semptom ameliyattan iki hafta sonra düzelmeye başlamış ve 6. haftada tamamen düzelmiştir.

Bulgular: Son literatürde GAN nöropraksisi ile ilgili sınırlı sayıda vaka bulunmaktadır. Servikal pleksus ve aurikular bölge üzerindeki baskıyı en aza indirmek için baş ve servikal bölgeye koltuk başlığının ekstra dolgusu ile veya at nalı başlığı kullanılarak özel dikkat gösterilmesini öneriyoruz. Bildiğimiz kadarıyla Türkiye'nin ilk vaka sunumu olarak EMG ile doğrulanan GAN'ın arka dalında nöropraksi gelişmiştir.

Sonuç: Bu olgu, nadir görülen bu komplikasyon hakkında farkındalık yaratmayı amaçlamaktadır. Komplikasyonları önlemek veya azaltmak için plaj sandalyesi konumlandırma için yeni malzemelerin üretilmesi ve kullanılması gerektiğini düşünüyoruz.

Anahtar Sözcükler: Nöropatoloji, omuz, artroskopi, hasta pozisyonu.

Introduction

Over the past 20 years, arthroscopy of the shoulder has been shown to be a good choice of procedure for diagnostic purposes and treatment of shoulder pathologies. Clinical success ratios of surgery increase with arthroscopic experience and new material designs¹.

Depending upon the surgeon's choice, the surgical procedure is performed either in the beach chair position or in lateral decubitus. Beach chair positioning has some advantages that entire joint exploration by the weight of extremity without effort, reducing the risk of brachial plexus injuries, easier and faster positioning²⁻⁴.

Despite these advantages, complications can occur including upper extremity deep vein thrombosis, pulmonary embolism, stroke, reduced cerebral perfusion, stretching of brachial plexus, neuropraxia and loss of vision. Complications associated with lateral decubitus positioning also include traction injuries, thromboembolic events, difficulty in airway management. Also in recent literature, it is controversial which position is better for arthroscopic treatment of the shoulder⁵⁻⁷.

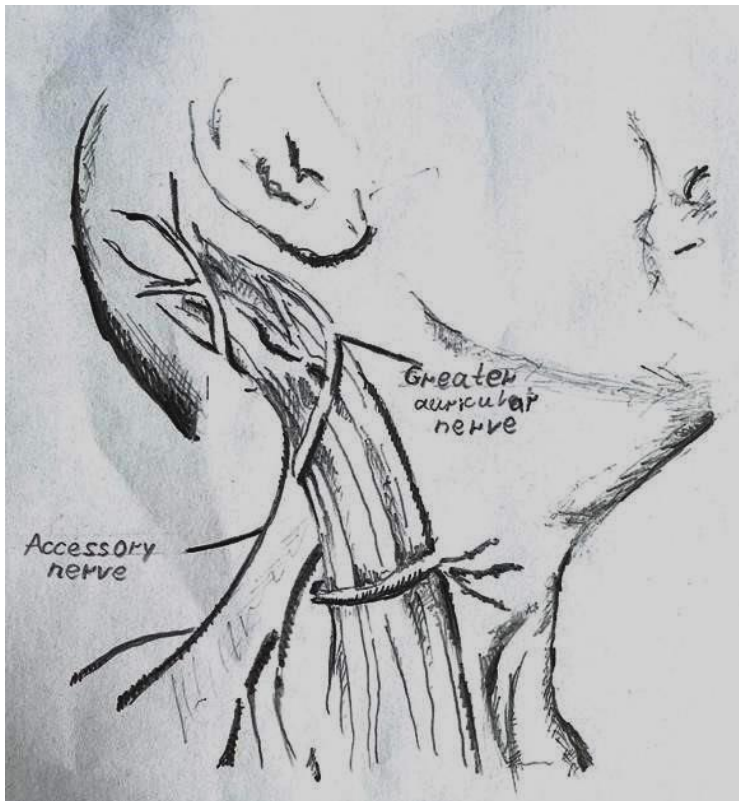
As far as we know, this is the first case in our country involving greater auricular neuropraxia with stretching and compression following arthroscopic repair of Bankart lesion operated in the beach chair position.

Anatomy

The great auricular nerve (GAN) is a superficial branch of the cervical plexus, contributed to by fibers from the C2 and C3 spinal nerves. GAN takes place along the anterolateral sides of the medial scalene and levator scapulae muscles, and within the depth of the sternocleidomastoid muscle⁸.

The GAN starts from the cervical plexus. Then, it continues on the posterior surface of the sternocleidomastoid muscle and turns around anteriorly over the lateral surface before coursing superiorly, splitting into anterior and posterior branches. The anterior branch innervates the skin over the parathyroid gland and the lower part of the preauricular region. Whereas the posterior branch innervates the skin over the mastoid process and lower part of the external ear. The anterior branch supplies the skin overlying the parathyroid gland and lower preauricular region and posterior branch supplies the skin over the mastoid process and lower external ear (Figure 1).

Figure 1. Presentation of GAN and its branches



Case Presentation

A healthy 32 old male patient has been presented at our clinic with left shoulder pain. He had been suffering from dislocation of the shoulder for 6 months before admission.

The shoulder had been reduced and immobilized in the emergency room. Physical therapy and rehabilitation program has been attended to after immobilization. His shoulder range of motion was limited due to pain. The left shoulder showed a soft tissue Bankart lesion as a result of magnetic resonance imaging (MRI). Based on symptoms, physical examination and screening, an operation has been planned.

Anesthesia and Positioning

In the operating room, monitoring included electrocardiogram, noninvasive arterial blood pressure (NIBP) and pulse oximeter (SpO₂). We used a 20 gauge catheter in order to infuse 0.9% sodium chloride (5–10 mL/kg/h) intravenously. 0.02 mg/kg Midazolam used for sedation. Anesthesia was induced with IV 2 µg/kg fentanyl, 2 mg/kg propofol. Endotracheal intubation was facilitated by 0.6 mg/kg rocuronium bromide intravenously. For anesthesia maintenance, the patient has received 2% sevoflurane in 40% O₂ - 60% air mixture and remifentanyl infusion (0.25 µg/kg/min) intravenously. Intravenous tramadol (1 mg/kg) and metoclopramide (10 mg) were given to the patient during the last 30 minutes of the surgery. For decurarization, IV 0.5 mg atropine and 1.5 mg neostigmine were given to the patient at the end of the surgery.

The surgery was performed under general anesthesia. Endotracheal intubation was performed to the patient in the beach chair position. For left shoulder arthroscopy; the patient was upright at an angle of 45 degrees to the floor, hips flexed at 60 degrees and knees flexed at 30 degrees. (Figure 2A and 2B) The head and the cervical region were positioned securely in a horseshoe-shaped headrest in a neutral position.

Figure 2A and 2B. Beach chair positioning of the patient. Note that the 45 degrees of upright to the floor, 60 degrees of hip flexion and neutral position of head

Figure 2A



Figure 2B



Operation

After prophylactic antibiotic administration; the left glenohumeral joint and subacromial space have been visualized by using a posterior arthroscopic portal. Bankart lesion has been detected by visualizing the anteroinferior labrum. There were no other shoulder pathologies revealed arthroscopically. Then, anterior and anteroinferior portals were opened to repair the anteroinferior labral lesion. By using two suture anchors, the labrum has been fixed to glenoid arthroscopically. Shoulder motions were controlled and secured. Operation has been completed with a total anesthesia time of 110 minutes.

Postoperative Follow-Up

In recovery, the patient complained of left posterior auricular distributed pain. Postoperatively, the pain diminished to a minimal level. The day after, he felt dysesthesia and numbness at the middle and lower third of the posterior facade of his left auricle.

EMG study was managed at 10th day after surgery and revealed that the neuropraxia in the greater auricular nerve. Symptoms have started to recover after two weeks postoperatively and resolved completely by 6 weeks.

Discussion

Shoulder arthroscopy is performed in either the beach chair or lateral decubitus positions. The choice of positioning depends on the surgeon's preference which has their own advantages and disadvantages. Beach chair position is used to evaluate the glenohumeral joint accurately with less effort and diagnose subacromial pathologies increasing visibility.

The risk of complications after arthroscopic procedures is less than 1 to 8 percent⁹ and nerve injuries have been reported as less than 0.1 to 0.2 percent¹⁰ according to existing literature. In a study reported by Weber et al in shoulder arthroscopy procedures the risk of complications is 5.8 to 9.5 percent¹¹ and Berjano et al.¹² it is 10.6 percent.

Many neurological and thromboembolic complications were reported about beach chair positioned arthroscopy of the shoulder¹². Most vital complications reported for patients undergoing surgeries in the beach chair position are spinal cord infarction and mid-cervical quadriplegia. Holtzman et al reported lateral femoral cutaneous nerve palsy in beach chair positioning at a rate of 1.3 percent¹³. The great auricular nerve is subject to direct compression and vulnerable to neuropraxia due to its anatomical route.

In our case report, while positioning, a horseshoe headrest was not used, and neuropraxia in the posterior branch of the left GAN was associated with stretching because of malposition of the head deviated to the right, and compression of the sternocleidomastoid muscle was reported. The

diagnosis was based on the symptoms of the patient and the location of the symptoms. The EMG study confirmed our diagnosis and symptoms were revealed after 6 weeks. The lesser occipital nerve is, like the GAN, under similar risks because of compression.

An informed consent form was signed by the patient.

Conclusion

In shoulder surgery, major importance should be focused on positioning to avoid the risk of complications, especially in operations under prolonged time. Under general anesthesia, while patient in beach chair positioning; special care should be taken to head and cervical region with extra-padding of headrest or using horseshoe headrest to minimize the compression over cervical plexus and auricular region.

We also recommend that head position should be monitored frequently in perioperative period and to avoid the possible neurological complication head should be repositioned.

REFERENCES

1. Bek D, Ege T, Erdem Y, Tunay S. Severe cartilage loss caused by metallic anchors in surgical treatment of a Bankart lesion: report of three cases. *Joint Diseases and Related Surgery*. 2015;26(2):116-119.
2. Gelber PE, Reina F, Caceres E, Monllau JC. A comparison of risk between the lateral decubitus and the beach-chair position when establishing an anteroinferior shoulder portal: a cadaveric study. *Arthroscopy*. 2007;23(5):522-528.
3. Skyhar MJ, Altchek DW, Warren RF, Wickiewicz TL, O'Brien S.J. Shoulder arthroscopy with the patient in the beach-chair position. *Arthroscopy*. 1988;4(4):256-259.
4. Peruto CM, Ciccotti MG, Cohen SB. Shoulder arthroscopy positioning: lateral decubitus versus beach chair. *Arthroscopy*. 2009;25(8):891-896.
5. Hariri A, Nourissat G, Dumontier C, Doursounian L. Pulmonary embolism following thrombosis of the brachial vein after shoulder arthroscopy. A case report. *Orthop Traumatol Surg Res*. 2009;95(5):377-379.
6. Pohl A, Cullen DJ. Cerebral ischemia during shoulder surgery in the upright position: a case series. *J Clin Anesth*. 2005;17(6):463-469.
7. Papadonikolakis A, Wiesler ER, Olympio M.A., Poehling G.G. Avoiding catastrophic complications of stroke and death related to shoulder surgery in the sitting position. *Arthroscopy*. 2008;24(4):481-482.

8. Berry M, Bannister LH, Stranding SM. Nervous system. In: Bannister LH, Berry MM, Collins P, Dyson M, Dussek JE, et al. *Gray's Anatomy*. 38th ed. New York: Churchill Livingstone; 1995:901-1937.
9. Small NC. Complications in arthroscopic surgery of the knee and shoulder. *Orthopedics*. 1993;16:985-988.
10. Rodeo SA, Forster RA, Weiland AJ. Neurological complications due to arthroscopy. *J Bone Joint Surg Am*. 1993;75:917-926.
11. Weber SC, Abrams JS, Nottage WM. Complications associated with arthroscopic shoulder surgery. *Arthroscopy*. 2002;18:88-95.
12. Berjano P, Gonzalez BG, Olmedo JF, Perez-Espana LA, Munilla MG. Complications in arthroscopic shoulder surgery. *Arthroscopy*. 1998;14:785-788.
13. Holtzman AJ, Glezos CD, Feit EJ, Gruson KI. *Arthroscopy*. 2017; 33(11):1958-1962.