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Arthroscopic shoulder assessment in Turkish amateur boxers

Research Article

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Abstract: The most common injuries reported in the literature regarding the sport of boxing are to the brain, eyes, kidneys and hands. Shoulder injuries have not been fully reported in the literature until recently , as a result we aimed to present our arthroscopic findings in amateur boxers. Ten amateur boxers with complaints of pain in the shoulder region and decreased performance during sportsplay were enrolled. They were evaluated by physical examination, radiology and arthroscopy. There were no clinical findings of instability. One patient was found to have subacromial impingement; six had crepitation at various degrees during shoulder movements. At arthroscopy, all patients had a variety of pathological findings. Five patients had Grade 1, three had Grade 2, and two had Grade 3 chondropathy. Various degrees of fraying of the anterosuperior and posterosuperior regions of the glenoid labrum were noted in all cases. Three patients had superior labrum anterior and posterior lesions, one patient had a posterior labroligamentous lesion, and one had chondral erosion in the anterosuperior portion of the humeral head. In conclusions, although the injury mechanism of the shoulder during boxing is unknown, this study shows that shoulder complaints in boxers should be considered as possible indicators of serious intra-articular lesions.

Keywords: *Boxer • Shoulder • Arthroscopy*

1. Introduction

Injuries during sports play vary according to the type of sport. While shoulder and upper extremity injuries are common, (20%), for instance in rugby [1], hyperextensive hand injuries are seen in handball goal keepers [2]. On the other hand, traumatic injuries of the head and neck are encountered in kick-box and karate [3].

In recent years, long-term studies of injuries sustained during boxing matches have been reported in the literature. With the increasing visibility of the sport and its athletes, we have become aware of the long-term damage to health and individual safety, especially chronic neurological, cerebral, and ophthalmological damage, documented by electroencephalographic recordings, computed tomograms, and neurological examination in boxers [4,5].

The most common injuries during boxing have been reported to take place to the brain, eyes, kidneys and hands [4-10]; those to the head and the hands being the most common [5,9,10]. In spite of the fact that the shoulder is a very important joint of this sport, there is only one case report published about an intraarticular lesion in the English literature [8]. Therefore, in this report, we present the clinical and arthroscopic findings of 10 amateur boxers with shoulder injuries.

2. Material and Methods

Ten male boxers with shoulder pain and decreased performance during sports were enrolled in the study. Mean age and duration of boxing of the subjects were 24.2 years (range 21-31) and 6.3 years (range 4-12) respectively. Similar to other boxers, the training frequency of the subjects was 3-5 days/week; but every day for 2-3 months before a tournament (1-2 times a year). The most common complaint was increasing shoulder pain toward the end of sportsplay and difficulty in punching. Instability and impingement tests were

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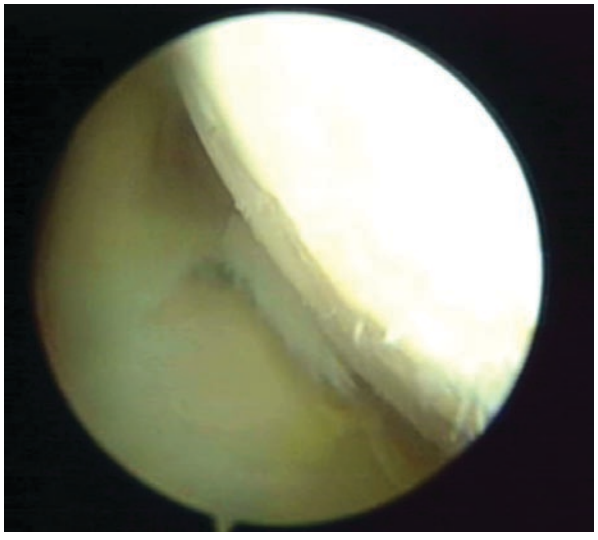
Figure 1. Arthroscopic view of chondral lesion in anterosuperior portion of the humeral head.



applied to all patients preoperatively. They were also evaluated with pre-operative magnetic resonance imaging (MRI). Informed consent was taken from every patient.

2.1. Surgical technique

Five of the patients had interscalene block and five others had general anesthesia. All procedures were done by the same orthopedic surgeon in a beach chair sitting position for arthroscopy. The arthroscopic technique consisted of an initial examination of the subacromial region and bursal-side of the rotator cuff. Thereafter, arthroscopic examination of the glenohumeral joint was performed. All intra-articular joint structures were examined; the lesions were noted and treated arthroscopically.

3. Results

No pathologic instability was noted. One patient was found to have subacromial impingement. Six patients had findings of crepitation at various degrees of motion during physical examination. MRI revealed slight edema in the subacromial region and slight degeneration in the insertion of the supraspinatus in one patient. SLAP lesion was observed in one patient. The other patients did not have any significant MRI findings.

Arthroscopic evaluation revealed sclerosis and irregularity on the under surface of the acromion in one patient (%10). None of the subjects had any rotator cuff pathology. All patients had various degrees of glenohumeral joint pathology; degenerative changes of the articular cartilage as described by Outerbridge,

Figure 2. Labral fraying due to chronic glenohumeral instability.

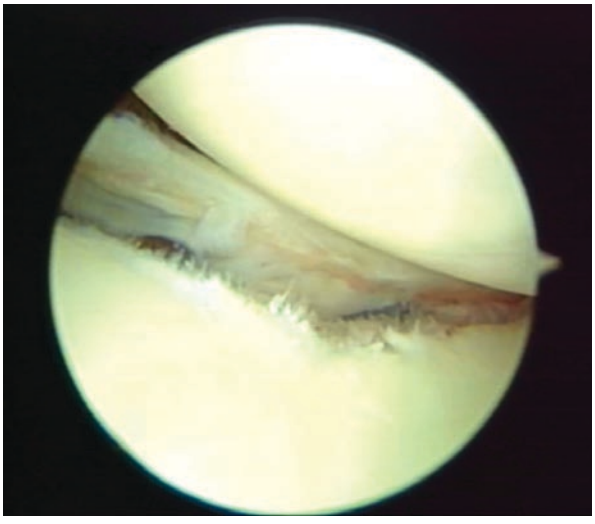
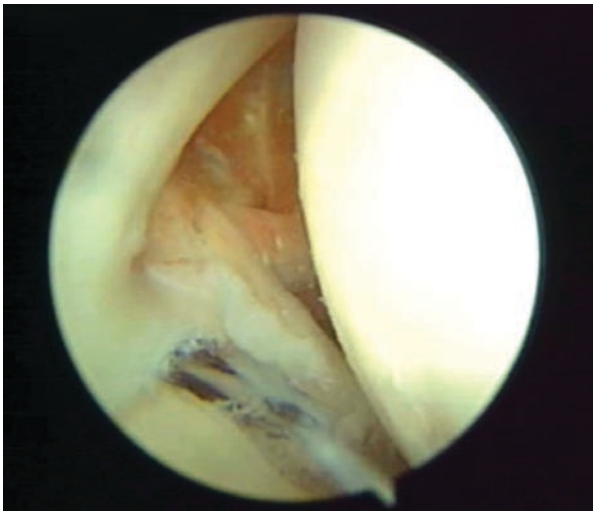


Figure 3. Typical SLAP type 2 lesion in the right shoulder.



were used as the criteria for osteoarthritis of the humeral head and the glenoid [9].

Five patients (50%) had Grade 1, three (30%) had Grade 2, and two (20%) had Grade 3 chondropathy –all involving the upper half of the glenoid (Figure 1). In one case, healed chondral lesion was observed at the anterosuperior portion of the humeral head.

Various levels of fraying of the anterosuperior and posterosuperior regions of the glenoid labrum were noted in all cases (Figure 2). Three patients (%30) had SLAP lesions (Figure 3) and they were treated with suture anchor. Details of the lesions are shown in Table 1.

Two patients (20%) that had Grade 3 chondropathy had their cartilage lesions treated by chondroplasty utilizing monopolar radio frequency (Vulcan RF system, TAC-S Electrothermal probe, Smith & Nephew

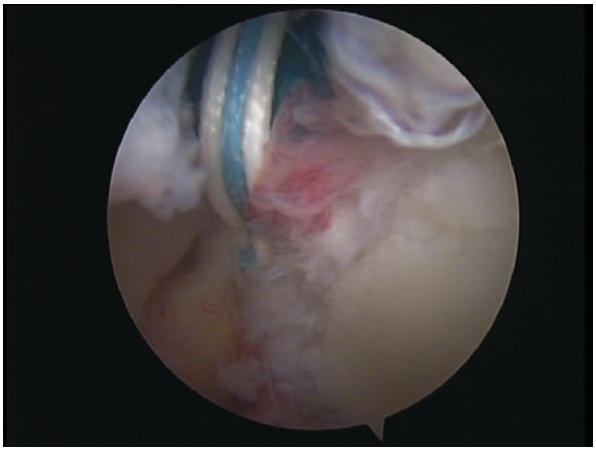
Table 1. Patients demographics and arthroscopic pathologies.

Case Number	Age	Duration of boxing (Year)	MRI Findings	Arthroscopic Findings			Surgical procedure
				Chondropathy (Glenoid surface)	SLAP	Labral lesion	
1	31	12	SLAP lesion	Grade III, Healed chondral lesion on humeral head	Type V	AS + PS Labral fraying	SLAP repair, chondral debridement
2	21	4	-	Grade I	-	AS Labral fraying	Debridement (Shaving, RF)
3	23	6	-	Grade II	-	AS + PS Labral fraying	
4	25	8	-	Grade II	Type II	AS + PS Labral fraying	SLAP repair
5	22	4	-	Grade I	-	AS + PS Labral fraying	debridement (Shaving, RF)
6	23	5	-	Grade I	-	AS + PS Labral fraying	Debridement (Shaving, RF)
7	24	6	-	Grade I	-	Posterior Labroligamentous lesion	Posterior labrum repair
8	27	8	-	Grade III	Type II	AS + PS Labral fraying	SLAP repair, Chondral debridement
9	21	4	-	Grade I	-	AS + PS Labral fraying	Debridement (Shaving, RF)
10	25	6	SST edema, degeneration	Grade II	-	Labral fraying	Arthroscopic subacromial decompression

SLAP: Superior Labrum Anterior Posterior Lesion, AS: Anterior superior, PS: Posterior superior

Figure 4. Acute posterior labral tear after punching.

Figure 5. Arthroscopic repair of the posterior labral tear with a suture anchor.



Endoscopy, Andover, USA). Degenerative SLAP tears and labral fraying were treated using RF and rotary shaver. The patient with a posterolabral lesion was repaired with anchor (Twinfix Ti Anchor 3,5 mm Smith & Nephew Endoscopy, Andover, USA) (Figure 4,5).

In all patients, shoulder pain disappeared after arthroscopy and they returned to active sports. Except the four patients in whom repair was performed due to SLAP lesion and posterior labral tear, all subjects started strengthening exercises on the postoperative 2nd month and returned to sports on the 3rd month. Those four patients started exercises on the 4th month and returned to sports on the 6th month.

4. Discussion

In this study, results pertaining to the arthroscopic management of 10 amateur boxers with shoulder pain and decreased functional performance were reported.

Zazryn et al presented a series of injuries during boxing by reviewing records that contained 16 years of research and findings [5]. Head injuries were the most frequent (89.8%) in their study [5]. The other injuries frequently seen were to the hands and fingers. However, no information concerning shoulder injures was reported in that study. Osteochondritis dissecans of the humeral head in an immature athlete has been reported in another study [11].

Numerous shoulder joint injuries have been reported in association with specific sports, especially those involving throwing, pitching, and repetitive overhead activities [12-17]. These studies indicate that the resultant pathologies are either associated with the manner the shoulder is used during that sport or with a specific mechanism of injury.

Injury mechanism of the SLAP lesions is controversial [12,18,19]. Burkhart et al. described arthroscopically a dynamic peel-back phenomenon in throwers with Type II SLAP lesions [12]. According to the author, an acquired contracted posterior inferior capsule causes the limitation of internal rotation in abduction and may predispose the shoulder to develop a posterior SLAP lesion especially in thrower athletes. This mechanism explains SLAP lesions in pitchers, but it is unknown whether or not this mechanism may also be true for boxing injuries. Boxers do not use all phases of throwing during their play. The other mechanism presented by Andrews et al was that the tensile forces from the biceps cause SLAP lesions during the end of the throw [18]. These lesions are specifically located in the anterosuperior portion of the glenoid. They proposed that the biceps tendon acted to pull off the labrum. In our study, all SLAP lesions were found in the anterior and anterior superior portion of the labrum. Therefore, this mechanism can play a critical role in the injury of the boxer's shoulder.

Jobe et al have described impingement-instability overlap [19]. They suggested that repetitive throwing gradually stretched out the anterior capsuloligamentous complex, allowing anterosuperior migration of the humeral head during throwing. This mechanism may also be important in the boxer's shoulder especially regarding labral fraying.

Another finding of our study was that the intra-articular pathologies seemed to parallel the number of sport years. Two cases with Grade 3 chondropathy were boxers who had more than 8 years of experience in this sport and 3 patients with grade II chondropathy had more than 6 years of experience. The duration of instability may indeed affect the increase in joint degeneration.

Repetitive micro trauma can lead to serious problems in the shoulder is a fairly well-accepted principle. Degenerative labral and SLAP lesions that we encountered in the anterosuperior and posterosuperior labrum could be due to the relation of the glenoid and the humeral head during punching; anterior glenoid lesions during a missed swing and posterior glenoid lesions when the punch hits the target [13]. All these injury mechanisms need to be corroborated with future studies that comprise larger samples.

In summary, in the light of our results, we may conclude that shoulder complaints in boxers can represent serious intra-articular lesions, even in the absence of clinical instability. Rotator cuff disease may not be seen in this patient population. Further, investigation of the injury mechanisms in boxer shoulders can help prepare for future preventive precautions.

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