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Case report

Arthroscopic treatment for elbow intraarticular loose bodies

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Abstract

We present a case of 29 years old man, diver, exposed to heavy work. He accused pain at the level of right elbow. Plain radiographs suggested a calcified intra-articular body. Intra-articular bodies are generally composed of cartilage in some cases, or cartilage and bone in other cases and result from several processes that leads to degradation of the articular surface.

They derive nutrition in great extent from synovial fluid and contain any type of the cells of bone or cartilage. The surface cells compose more cartilaginous layers, enlarging in this way the body over time. Most deeper cells receive less nutrition than the others, leading to cell death and calcification An MRI was performed in this study to better characterize not only the location but also consistency and mobility of this body. An arthroscopic procedure was done to remove all these bodies. The results were good with disappearing of pain.

Keywords : radiographs, MRI, magnetic resonance imaging, loose bodies, arthroscopy

Highlights

- ✓ Intra-articular loose bodies are one of the sources of pain at elbow; the most common complaint is pain inside the joint, in the moment of elbow movement.
- ✓ Many times, surgery is necessary to remove the lose bodies from the joint. The less invasive procedure is arthroscopic removal

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Introduction

The elbow is a complex joint, allowing four types of movements: flexion, extension, pronation and supination. Three bones are involved to form this structure: humerus (the upper arm), ulna (the forearm on the pinky finger side) and radius (the forearm on the thumb). The extremity of each bone is covered with a thin articular cartilage that protects and absorb forces at this level. Inside the joint there is an inner smooth tissue, called synovial membrane which makes a small amount of liquid that lubricates the joint and permits movements almost without friction. In fact, the elbow joint is a combination of hinge and pivot joint. The hinge allows us to bring hand at mouth and extend the forearm; the pivot allows us to rotate the hand with palm up and down (1).

Loose bodies are a common cause of elbow pain. They appear in two situations: 1. bodies definitely due to trauma, when fragments of cartilage are broken and flow free in the joint 2. bodies not definitely due to trauma. Patient involved in repetitive activities have the tendency to develop lose bodies (weightlifting and heavy manual work). These cartilaginous fragments are fed by the synovial liquid presented inside the join and grow, being responsible for the symptomatology. Their presence in the joint can be unnoticed, or very symptomatic: pain, locking, popping. The proper diagnostic and treatment (especially minim invasive procedures) can lead to improvement of symptomatology (2).

Sometimes it is possible to live with bodies in the elbow without difficulty, but other times, the presence of these bodies produces symptoms as: pain, popping, locking of joint. Radiographic findings of the bodies in the joint in combination with symptoms can determine the surgeon to operate and remove bodies. In addition, resistance at conservative treatment can lead also to surgical option.

Usually, the symptoms disappear after removal of bodies from the joint. The easiest way is to do this arthroscopically. This procedure is a minimally invasive technique, which allows the surgeon the access inside the joint with fewer traumas to muscles. Because of that, the rehabilitation is by far more quickly. It is important to know that osteoarthritis problem cannot be resolved with arthroscopy. Another advantage of procedure is the low rate of complication. In majority of cases they are minor and can be treated easily (3).

This technique is very helpful in realizing pain from lose bodies, but is not able to restore the integrity of the cartilage.

Case report

We present the case of a 29-year-old, diver, who presented to hospital with sudden non-traumatic right elbow pain. On physical exam the patient had small limitation of mobility of the elbow from 10 to 175 degrees. His supination and pronation were symmetric and full at 90 degrees. There was no palpable effusion and the neurovascular examination was normal. Initial treatment was conservative, with physiotherapy. Plain radiographs showed a mobile, irregular, calcific opacity over the elbow joint (Figure 1, a - b).

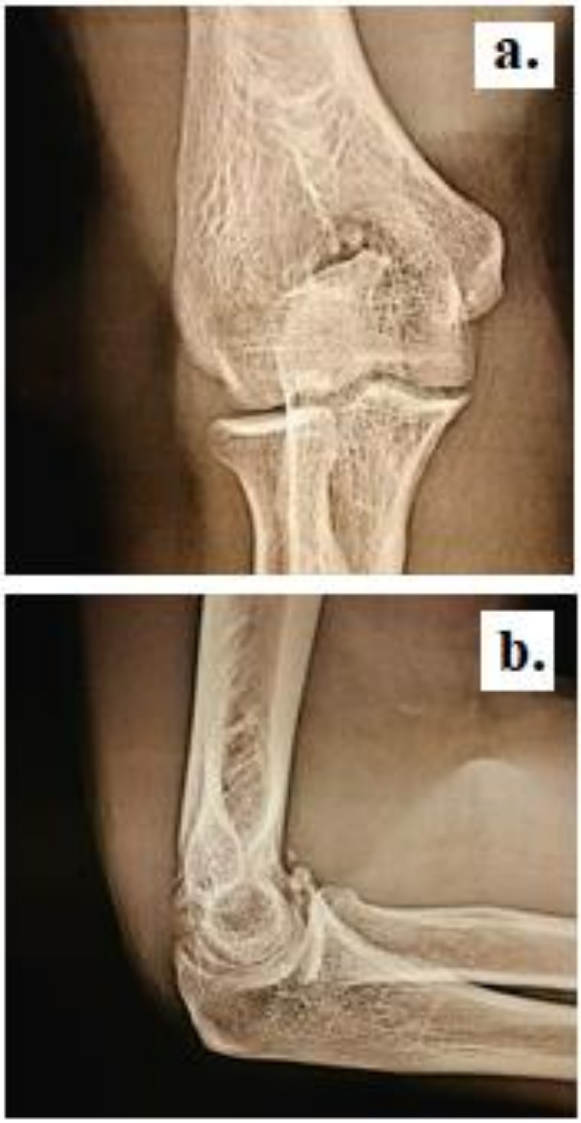

Figure 1. a) the anteroposterior radiography b) the lateral radiography shows multiple loose bodies in right elbow joint

MR image of the elbow was then ordered to validate and characterize location, consistency and mobility of the loose body and provide more diagnostic information. Because conservative treatment failed to improve symptomatology, an arthroscopic surgery was done using a standard 30-degree arthroscope through anterolateral, medial, posterior and posterolateral portals (Figure 2, a - b).

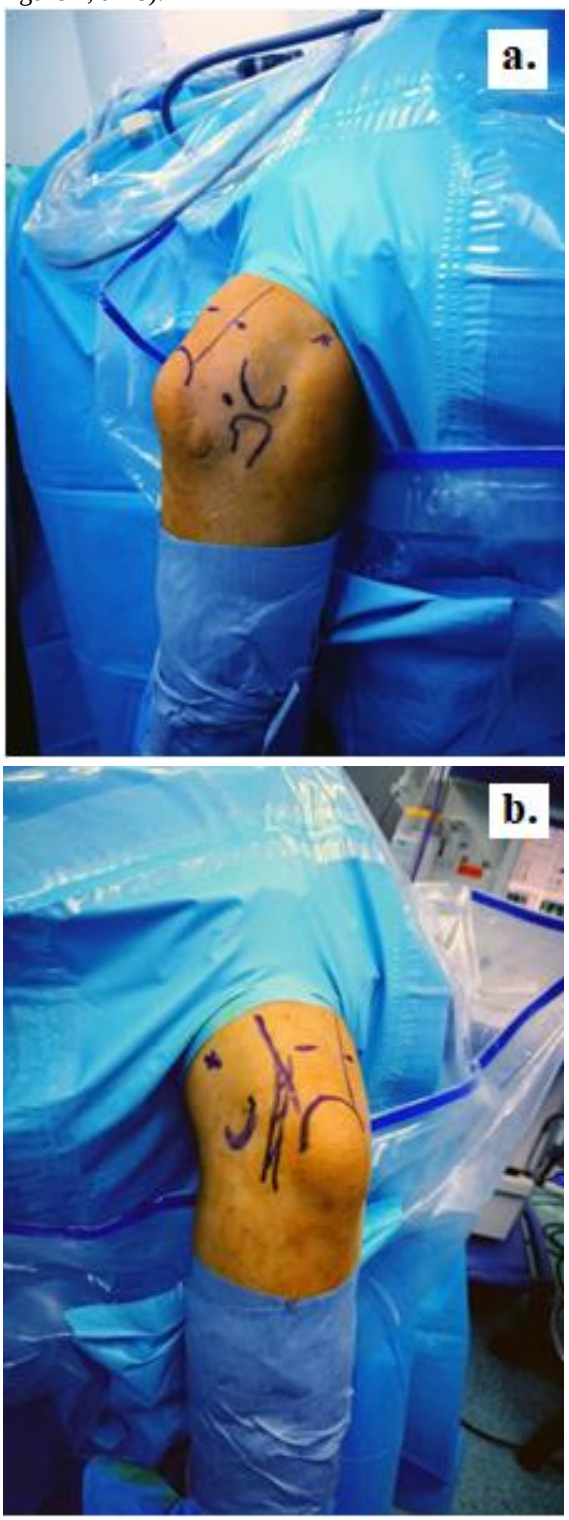

Figure 2. a) and b) Arthroscopic portals

Anterior, medial, lateral and posterior compartment were thorough examined. The loose bodies were extracted from the join, totally 15 pieces (Figure 3).

Figure 3. Fifteen fragments were removed from the elbow joint

Following this procedure, the elbow was wrapped in a sterile dressing and ace wrap with no splint. Motion was started in the immediate after procedure. Postoperative examination at one week showed only a minor swelling, but pain disappeared (Figure 4, a-b). He returned to his work with no limitations two weeks postoperatively.

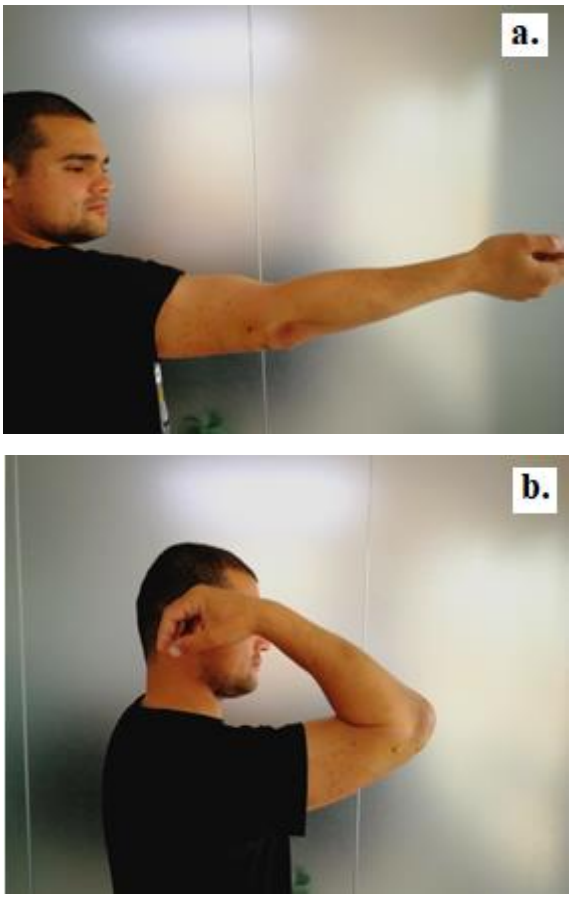

Figure 4. Elbow joint mobility after the arthroscopic procedure

Discussions

Lose bodies are a real problem of healthy. The presence of these structures in the joint lead to pain, popping or limitation of elbow motion. Our patient was a heavy-duty worker (1). His job involved repetitive trauma at the level of elbow. This resulted in apparition of a multiple fragments inside the joint.

The extreme force and valgus/varus overload seen in his activities places abnormal forces on the elbow, and is felt to contribute significantly to the disease process. Loose bodies from the elbow can contribute to decreased range of motion (ROM) as in the case presented here (2).

The initial evaluation of elbow is done using radiographies: anteroposterior and lateral view. In detection of lose bodies, this method has sensitivity which varies from 38-75%. Sometimes, bodies are not visible on x-ray, because they are cartilaginous. The radiographs allow finding an associated pathology as osteoarthritis (narrowing of the joint space, the presence of osteophytes).

MR and CT arthrography have variable sensitivity (88 – 100%) and specificity (20-27%) in the detection of presence of lose bodies (3). Indirect MR arthrography (IV administration of contrast for a quasiarthrographic study) can be helpful in some cases, particularly with biphasic imaging in perplexing cases (4).

Arthrography was not used in our patient since arthroscopy was already planned based on the radiographic and non-arthrographic MR findings. CT arthrography can also be used to detect loose bodies. CT, however, does display extra-articular soft tissue abnormalities as well as MR. MRI can also directly demonstrate evidence of osteochondritis dissecans, although these findings were not directly evident on the MR images of our patient (5).

In many cases symptomology improved during conservative treatment (activity modifications, physiotherapy and non-steroidal anti-inflammatory drugs). Therapy exercises may provide more strength and motion. In case of failing the arthroscopic procedure is the best option (6).

Presence of elbow symptomatology in combination radiologic detection of intra-articular loose bodies is indicative for surgical treatment. This consists in removal of these bodies out from the joint. The resistance at conservative treatment is also an indication for surgery.

The most popular procedure is arthroscopic removal of lose bodies, due to low morbidity. With the help of the instruments introduced through small holes in the joint, is possible to visualize all spaces of the joint and to take out the bodies as whole, or in pieces. Sometimes are necessary accessory portals for that. Also, can be performed concomitant another procedure requires as: synovectomy, or contracture release. The removal of lose bodies can be done also open, depending of surgeon experience, or preference.

Because we prefer the arthroscopic technique, we will describe this type of surgery. For this procedure, is used a standard 4.0 mm arthroscope with 30 degree viewing angle. To visualize the elbow structure, a low water flow is utilized. This prevent extra-swelling of the joint.

For the anterior compartment, we utilized anterior medial and lateral portals, for the posterior compartment, posterior lateral and posterior portals. At the beginning, the whole compartment of the joint is inspected and any damage is noted. The lose bodies are many times hidden in recess of synovial membrane and tethered to the joint with fibrous tissue. They can be removed with shaver, or with a grasper. Sometimes an accessory portal is necessary. It is important to re-inspect the joint before removing instruments to be sure that no body remained inside. A thorough post-operative neurologic examination was done and documented.

Hospitalization was short, only one day. Results were very good with no complications. Patient was able to start motion exercises immediately after the arthroscopy. Strengthening exercises were instituted within 3-4 weeks and full activities was allowed at 4-6 weeks.

Conclusions

Intra-articular loose bodies are one of the sources of pain at elbow. The most common complaint is pain inside the joint, in the moment of elbow movement. Other symptoms are: popping, locking and crepitus. In rare cases, motion cannot be possible, because of body location in coronoid fossa. Many times, surgery is necessary to remove the lose bodies from the joint. For that, a radiologic confirmation can be done. The less invasive procedure is arthroscopic removal (7).

The advantages of this procedure are multiples: reduced morbidity, a thorough evaluation inside the join and earlier rehabilitation.

Our patient reported an excellent outcome. It is known from some sources that improvement of symptoms can be very high. Claspers and Carr, reported 81% of their patients who had improvement in symptoms following the procedure. They noted significant improvement after the elbow arthroscopy, even if the pre-operatively diagnosed loose bodies could not be practically located (8).

We consider that arthroscopic evacuation of lose bodies is the best option for many patients, especially for those where symptomatology has no improvement after the conservative therapy.

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article, and there was no financial support that could have influenced the outcomes. The manuscript was read and approved by all authors.

Compliance with ethical standards

Any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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