

TECHNIQUE AND INDICATIONS OF ELBOW ARTHROSCOPY.

A twelve-cases report.

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L'ARTHROSCOPIE DU COUDE: TECHNIQUE ET INDICATIONS. A PROPOS DE 12 CAS.

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TECHNIQUE AND INDICATIONS OF ELBOW ARTHROSCOPY. A TWELVE-CASES REPORT.

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R É S U M É

Buts : Décrire la technique de l'arthroscopie du coude.

Méthodes : Nous rapportons une étude rétrospective d'une courte série de 12 cas d'arthroscopie du coude colligés sur une période de 4 ans. Les indications de cette technique étaient représentées par la résection de corps étrangers dans 7 cas, une fracture parcellaire et déplacée de la tête radiale dans 3 cas, d'une fracture de l'apophyse coronoïde dans un cas et d'une butée osseuse dans un cas.

Résultats : Nous n'avons noté aucune complication et au recul moyen de 18 mois (6 à 40 mois) nos résultats étaient le plus souvent satisfaisants.

Conclusion : L'arthroscopie du coude constitue une technique séduisante mais délicate. Ses indications sont actuellement peu fréquentes. Elles restent dominées par la résection des corps étrangers.

S U M M A R Y

Aim : Describe the technique of the elbow arthroscopy and discuss their indications through a series of 12 cases and a review of the literature.

Methods: We report a retrospective study of a short series of 12 cases of elbow arthroscopy performed on 4 years. The indications of this technique were loose bodies in 7 cases, parcellar displaced fracture of radial head in 3 cases, fracture of coronoid process in one case and osseous impingement in one case.

Results: We have noted no complications and at a mean follow up of 18 months (6 to 40 months) our results were almost satisfactory.

Conclusion: Elbow arthroscopy is an effective but delicate technique. Its indications are not frequent. They are dominated by loose bodies.

M O T S - C L É S

Coude, arthroscopie

K E Y - W O R D S

Elbow, arthroscopy.

التنظير المفصلي للمرفق. التقنية والدواعي. دراسة حول 12 حالة

الباحثون : حداد. ن. - شيبيل. م. - ميلي. و. - حنتاتي. ح. - خميري. ش. - الكانون. م. - قربي. ع. - بن دلي. ن. - الصدام. ح.

تشتمل دراستنا على 12 حالة تنظير مفصلي للمرفق أجريت خلال 4 سنوات. أكثر دواعي هذه التقنية تواجدا 7 (حالات) هو استئصال جسم أجنبي. بعد مدة متوسطة بـ 18 شهرا (6-40) على القيام بهذه العملية لم نسجل أي مضاعفات وكانت النتائج مرضية في أغلب الأحيان. نستنتج أن التنظير المفصلي للمرفق هي تقنية رائعة لكنها دقيقة.

الكلمات الأساسية : مرفق - تنظير مفصلي.

There still no doubts nowadays about the benefits of knee, shoulder and wrist arthroscopy. In the elbow, this technique has been described and performed for the first time in the 30's; however, its benefits are still much discussed. Most of the authors found arthroscopic exploration of the elbow hard and dangerous because of the proximity of neurovascular structures. Improvement of arthroscopic instrumentation and definition of determined anatomical landmarks enhanced the use of this technique especially in English-speaking countries. Many publications reported very encouraging results. We lately introduced elbow arthroscopy in AZIZA OTHMANA Hospital in Tunis, for the treatment of some pathology. We reported the surgical technique and indications in a short series of 12 cases.

MATERIELS AND METHODS

Technique :

General or loco-regional anaesthesia are administrated. The patient is in lateral position, with the arm over rest and the elbow flexed 90°. The tourniquet is applied to the proximal arm and inflated to 250 mm Hg.

Arthroscopic instruments include

- A 30° Head 4mm arthroscope to visualise the anterior compartment and a 2.7mm arthroscope for the posterior compartment,
- A shaver,
- An arthropump.

Two groups of portals are needed to explore both anterior and posterior compartments of the joint.

Portals for the anterior compartment

- Antero-lateral portal: situated in the corner formed by the capitellum and the radial head with the elbow flexed 90°. The radial nerve is the most vulnerable element. It is located at a distance ranging from 7 to 15 mm. The more this portal is established medially and anteriorly, the shorter this distance is. To reduce risks of radial nerve lesion, the portal is established after joint distraction with the elbow flexed 65° at least. This portal enables the visualization of the anterior compartment of the elbow except the lateral quarter of the radio-capitellar joint.
- Proximal-medial portal: situated 2 cm proximal and anterior to the medial epicondyle, in a palpable depression. This portal passes between the humeral vessels and the median nerve anteriorly and the ulnar nerve posteriorly, with the least normally at a distance of 20mm. The absence of anterior translocation or instability of the ulnar nerve is verified. This portal enables the visualization of most of the anterior compartment of the joint.

Portals for the posterior compartments

- Posterior portals: Established indifferently through the triceps tendon or directly into the olecranon fossa, 2 cm proximal to the tip of olecranon. Passing through the lateral para-olecranon groove is also possible. The last two portals are preferred to avoid the ulnar nerve which is at a distance of 20mm. The posterior portals enable visualization of the olecranon fossa and para-olecranon grooves. This exploration is made possible by good pressurisation and synovectomy in a semi-flexed elbow.
- Postero-lateral portal: located in the centre of the anconeus triangle (lateral epicondyle, olecranon and radial head). A 2.7mm arthroscope is used because of the narrowness of this compartment. This portal allows visualization of the posterior part of the radial head.

Some technical points are to be mentioned

- The anterior neurovascular structures are very close to the instruments placed in the anterior portals. It is usually recommended to inflate the joint before establishing the portals and introducing instruments. This inflation is made with a 50cc syringe through the antero-lateral portal.
 - N°11 blade is used to incise the skin. The remaining tissues are dissected using a smooth instrument.
- The joint exploration usually starts in the anterior compartment via the antero-lateral portal, by directing the trocar 45° on an elbow flexed 90°. The proximal-medial portal is established using the inside-out technique: the arthroscope is pushed in medially against the medial side of the capsule in the corner between the medial epicondyle and the coronoid. The arthroscope is then switched by a smooth trocar which is stuck to capsule and the skin is incised. A small inflow cannula is placed around the arthroscope and introduced in the joint. These

two portals are sufficient for exploring and working in the anterior compartment. The posterior compartment exploration is possible through the postero-lateral portal. In case of difficulties arthrotomy may be necessary. At the end of the intervention, the portals are usually stitched up with no draining after tourniquet deflating to control bleeding. The member's pulses are verified on the operatory table.

Series

Twelve cases of elbow arthroscopy were concerned by our study. 100% were male with an average age of 33 years (20 to 50). All patients were active manual workers. The dominant extremity was interested in half cases. Various indications of elbow arthroscopy were included:

- Three cases of parcellar displaced fracture of radial head. The small size of the fragments and their displacement in the anterior compartment of the elbow imposed their resection, realised by arthroscopy.
- One case of posterior lateral dislocation of the elbow initially reduced under general anaesthesia. Fractures of the coronoid and of lateral condyle with small displaced fragments in the anterior compartment were noticed on control X ray. Resection of these fragments was made by arthroscopy.
- Seven patients complaining of elbow pains and fragment blockings. All patients presented motion limitation in flexion and extension. Discomfort was due to repeated and aching blockings. X ray and arthroCTscan revealed loose bodies inside the joint in both compartments.
- In one case, a 21-year-old patient who was treated by immobilization a year before for parcellar non-displaced fracture of radial head, presented with remaining aches and rigidity (Extension: -40°, flexion: 100°). X ray and CT scan revealed an osteophyte on the coronoid and a bony lock in the olecranon fossa which were resected by arthroscopy.

RESULTS

All our patients were reviewed with a mean follow up of 18 months (6 to 40 months).

No nervous or infections complications was observed.

At the last follow up:

- In the three cases with parcellar displaced fracture of radial head, the functional results were excellent, with complete motion of the elbow in extension-flexion and pronosupination.
- In the case of posterior lateral dislocation, the elbow joint is stable with a mild deficiency of extension (-20°). The flexion and pronosupination are complete.
- In the cases of loose bodies, aching blocking disappeared and partial amelioration of the joint motion was noted. All of these seven patients have resumed their professional activities.
- In the case of releasing by resection of the coronoid and olecranon osteophytes, the result was good: we noted a 30° improvement in extension.

DISCUSSION

The benefit of arthroscopy in the treatment of pathologies of the knee encouraged the surgeons to extend the use of this technique to other joints. Arthroscopy seems to be interesting in elbow pathology knowing the difficulties and the big risk of rigidity after classic surgery. BURMAN (1) performed the first elbow arthroscopy in 1931. Nevertheless, this technique had been used until the late 80's. SMALL (2) reviewed 10,000 cases of arthroscopy over a period of 19 months and found 79 cases of elbow arthroscopy (0.77%). Elbow arthroscopy started to be frequently performed only in the 90's, particularly in the United States (frequency of pitcher elbow pathology) (2-5). We agree with the majority of the authors who confirm the toughness of this technique because of the exiguity of elbow compartments and closeness of neurovascular structures (6-10). The fact was well demonstrated by LYNCH (11) in a cadaveric study showing the portals proximity to neurovascular structures, especially the radial and ulnar nerves. The frequency of neurovascular complications varies in the different studies. SMALL (2) reported no complication in 74 elbow arthroscopies, while LYNCH & coll found 15% of complications in a series of 20 cases. Finally, SCHNEIDER (12) found 7 nervous complications among 67 cases (10%). In our series, we had no complication, but the small number of the cases does not allow us to objectively assess the complications of elbow arthroscopy. We think that the following technical rules should reduce neurovascular risks :

- Primary joint inflation
- Verification of the absence of ulnar nerve instability

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- Limitation of the incision to the skin

The review of literature shows that indications of elbow arthroscopy are increasing from day to day (3, 4, 5, 7, 12, 13-19). All authors agree about its contribution in pathologies such as loose body removal, osteochondritis dissecans, bone or synovial conflicts, synovitis and synovial biopsy. However, some other indications are still discussed, such as the treatment of degenerative pathology of the elbow or capsular release, although authors like GALLO & coll (15) or ANDREW & coll (7) reported satisfying results after arthroscopic treatment of these pathologies. Our series is short and our major indication was loose body removal. Our results are encouraging. Arthroscopy reduces infectious risks and post-operative pain. It also permits earlier and easier rehabilitation.

We agree with most of the authors in stating that ideal indications for elbow arthroscopy are:

- Loose body removal (chondromatosis, osteochondritis dissecans, fracture of radial head or of the coronoid).
- Bone or synovial conflicts.
- Synovial biopsy.
- Synovectomy in inflammatory pathology.

This technique should be performed by experienced surgeons who dispose of adapted equipment (3, 7, 10, 12, and 20).

CONCLUSION

Elbow arthroscopy is an attractive but delicate technique that needs to be performed following strict rules. Its indications are increasing; the major one is still loose body removal.

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