LONG-TERM RESULTS OF ELBOW ARTHROSCOPY IN 67 PATIENTS

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Based on the results of a retrospective study of 67 patients with diagnostic and surgical arthroscopy of the elbow from 1977 until 1991, we present our technique, results, complications, and indications for elbow arthroscopy. The average age of the patients was 26 years (range : 11-59). At the time of follow-up the patients were examined clinically as well as radiologically. The results were scored according to Figgie's score, which is based on the criteria of pain, function, power and range of motion. The overall score significantly increased from 61.6 preoperatively to 85.3 postoperatively. The age of the patient did not influence the results. However, patients who were laborers had a poorer outcome than the others. Patients with preoperative pain for 2 months to two 2 years had better results than patients with a preoperative course of more than 2 years.

Keywords : elbow ; pathology ; arthroscopy ; nerve injuries.
Mots-clés : coude ; anatomie pathologique ; arthroscopie ; lésions des nerfs.

INTRODUCTION

The first joint examined by arthroscopy was the knee joint. Since then, various joints have been inspected arthroscopically without any considerable technical problems (9, 11, 13, 14, 30). But is this operative procedure, with all its risks, beneficial for all patients ? Some years ago arthroscopy of the knee joint was considered as useless, and exploratory arthrotomy was preferred. These days renowned orthopedic and trauma surgeons call exploratory arthrotomy "the operator's joint section". Can this trend be adopted concerning joints other than the knee joint ? Is arthroscopy useful compared with the noninvasive diagnostic methods (12, 18) : sonography, computerised tomography and magnetic resonance imaging (MRI) ? In 1931 Burman (5) performed an elbow arthroscopy using 3-mm optics. In his opinion ("This is another of the large joints unsuitable for examination, since the joint space is so narrow for the relatively large needles.") it was not a very promising method. Nevertheless, in recent years experienced arthroscopic surgeons are increasingly interested in the elbow joint (2, 15, 19, 25, 27). Arthroscopy of the elbow is more difficult than arthroscopy of the knee. Access to the knee joint through a thin layer of soft tissue is without risk, whereas in elbow arthroscopy the arthroscope is inserted through muscle tissue in close relation to important neurovascular structures (3, 17, 19, 22, 26, 28).

MATERIALS AND METHODS

Patients

From 1977 to 1991, 67 elbow arthroscopies were performed at our institution. Patients' ages ranged from 11 to 59 years (mean age 26 years). Eighteen were females ; 49 were males. The 11-year-old patient had a hematogenous joint infection ; the child was treated by synovectomy and suction drainage. Sixty-one patients were followed for a mean period of 5.8 years after arthroscopy. The different diagnoses are presented in fig. 1.

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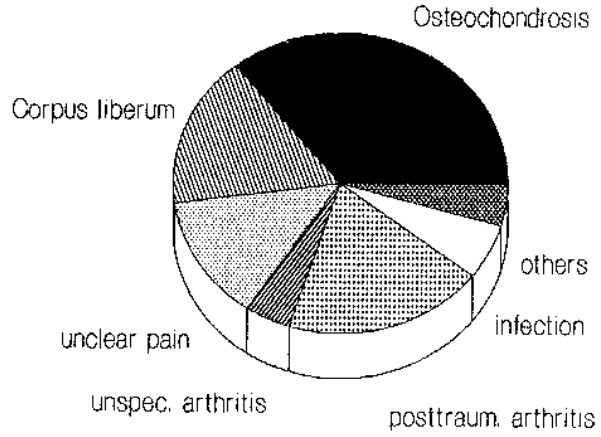

Fig. 1. — Distribution of the diagnoses of 67 elbow arthroscopies from 1977 to 1991.

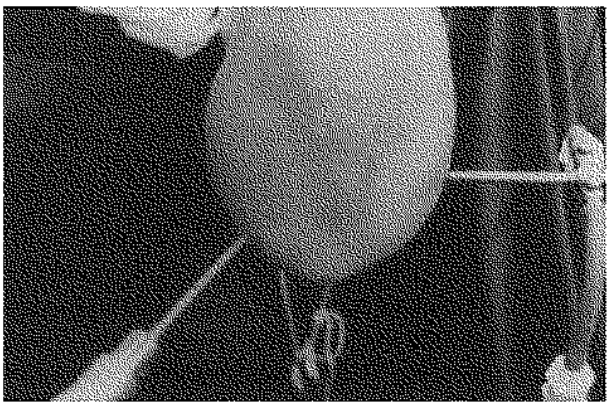

Fig. 2. — The upper extremity is rested in 90° elbow flexion allowing accessibility of all portals for the operator.

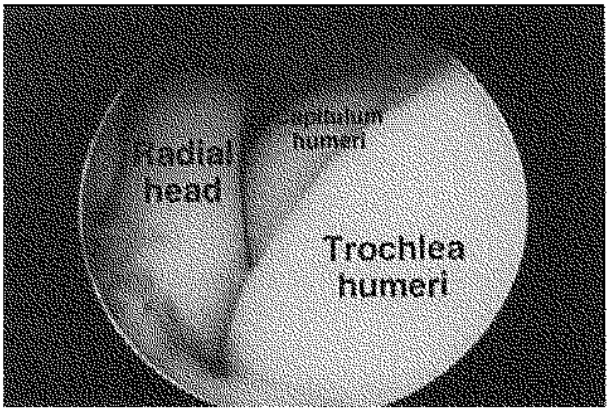

Fig. 3. — The anterior portal allows inspection of and operative intervention on the ventral joint (radial head, trochlea of humerus and capitulum of humerus).

For the assessment we included the clinical and radiological examination as well as Figgie's elbow score with the criteria of pain (30 p.), function (20 p.), muscle strength (10 p.) and range of motion (40 p.). Statistical evaluation was performed by SPSS-PC and Student t-or Chi-square-test.

In 19 patients we performed only diagnostic arthroscopy, whereas in 45 patients the diagnosis was followed by arthroscopic treatment. Due to technical problems in 3 cases the procedure was interrupted (posttraumatic arthritis and fibrotic joint stiffness in 2 cases, and 1 case of rheumatoid synovitis tamponading the joint).

Arthroscopic Instruments

The procedure is performed using standard 30° optics and a video system. In our experience, a smaller scope is not of benefit. Besides the standard arthroscopic instruments, we use motorized instruments, a Wissinger rod and an arm holder when the arthroscopy is done in the supine position.

Arthroscopic Technique

In the supine position the operated upper extremity is rested in 90° shoulder abduction and 90° elbow flexion allowing optimal range of motion of the elbow, accessible portals for the operator and relaxation of the neurovascular structures (fig. 2). In the first years the procedure was performed under general anesthesia, whereas in recent years we have progressed to plexus and cervical peridural anesthesia.

Once the standard preoperative preparations have been done, the joint is filled by a portal posterior to the palpable radial head. The portal for the scope is established by distension of the joint to provide the essential distance to the neurovascular structures. After a superficial skin incision in the region of the anterolateral portal the subcutaneous and muscle tissue is spread to the joint capsule by a vessel clamp, and the scope is inserted into the joint by a blunt trocar.

Through this anterolateral portal a first inspection of the ventral joint compartment can be performed (fig. 3), then the anteromedial portal is established using Wissinger's technique. The anterior portals allow the inspection of and operative intervention on the ventral joint. The distal posterolateral, the proximal posterolateral and the posterocentral portal provide a relatively safe approach to the dorsal joint compartment. These portals are sufficient for inspection of the joint and for

90% of the operative procedures. The posteromedial approach should be avoided to save the ulnar nerve.

RESULTS

The overall score (fig. 4) significantly increased from 61.6 preoperatively to 85.3 postoperatively ($p < 0.05$). The age of the patients (classified in 3 age groups ; 10-19 years, 20-29 years, 30-45 years) did not influence the results, but we found a relationship with the occupational category (fig. 5). Students and patients from the public service sector showed a significant increase in score, whereas in laborers this increase did not occur. Patients with preoperative pain lasting from 4 months to 2 years had significantly better results than patients with a preoperative course of more than 2 years. The poor results in patients with long-lasting symptoms might be related to degenerative changes. Analysis of the results concerning the criteria of pain, function, muscle strength and range of motion, indicates significant pain relief after arthroscopy but no improvement in the other criteria (fig. 6).

Of special interest was the relationship of the preoperative diagnosis and indication to the postarthroscopic outcome. We classified 3 groups of diagnoses : specific diagnosis confirmed (loose body, rheumatoid arthritis, joint infection), degenerative changes and nonspecific diagnosis

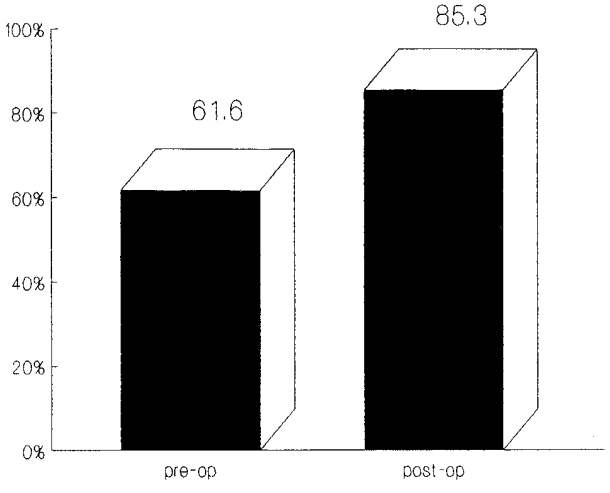

Fig. 4. -- The overall score (Figgie) significantly improved from 61.6 preoperatively to 85.3 postoperatively ($p < 0.05$).

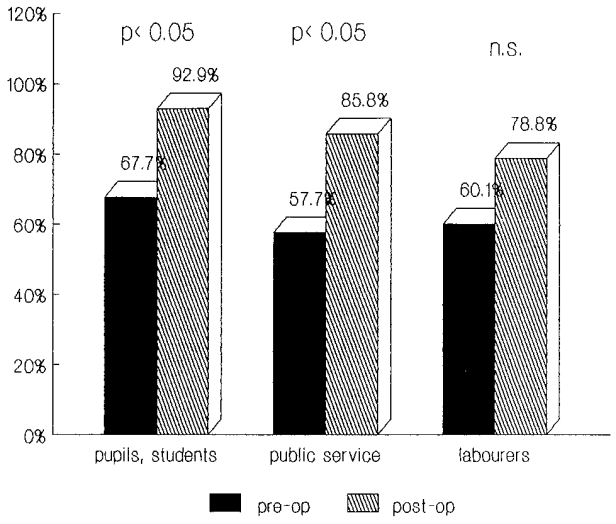

Fig. 5. - The analysis of patients' professions showed differences in success rates of elbow-arthroscopy. Students and patients in public service had significant improvement, whereas heavy manual laborers showed no significant difference between the preoperative and postoperative scores.

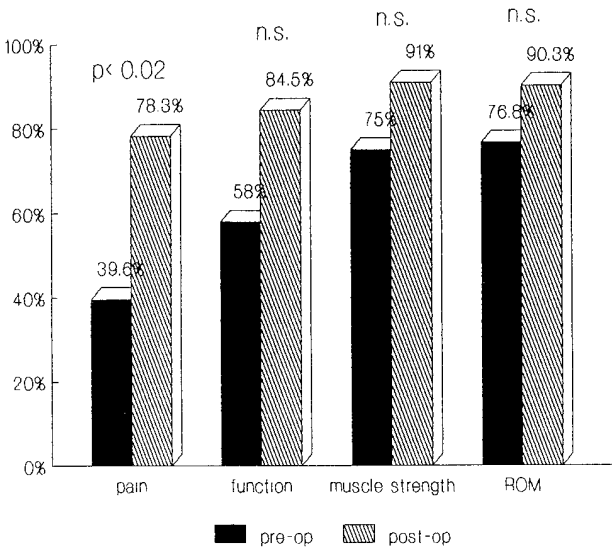

Fig. 6. Analysis of the results concerning the criteria of pain, function, muscle strength and range of motion, indicates significant pain relief after arthroscopy but no improvement in the other criteria.

(atypical pain, irritable joint). Patients with specific and clear preoperative diagnoses showed a significant improvement that was absent in patients with unclear arthralgia and severe osteoarthritis (fig. 7).

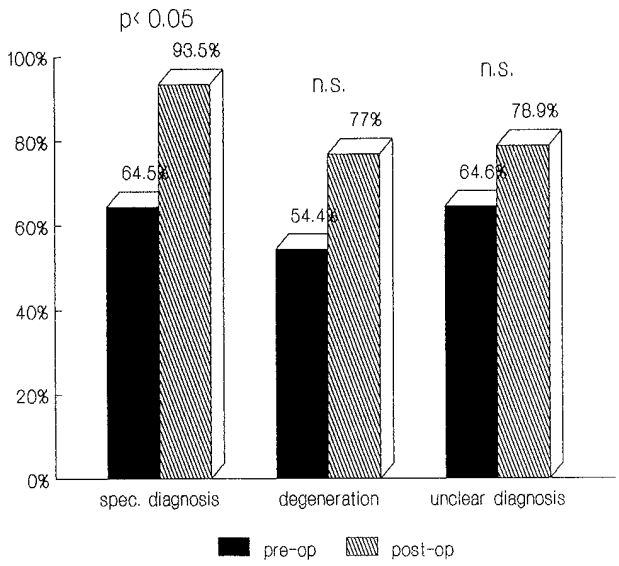

Fig. 7. — Patients with a specific and clear preoperative diagnosis showed significant improvement compared to patients with unclear arthralgia and severe osteoarthritis.

The differentiated analysis of the criteria of pain, function, muscle strength and range of motion showed the trend of good results in specific diagnosis, especially regarding the parameters pain and function.

A high rate of neurologic complications was striking, affecting the radial nerve in 4, the ulnar nerve in 2 and the median nerve in 1 case. The neurological deficits were temporary and lasted the longest in radial nerve involvement : one case required 6 months for regeneration.

DISCUSSION

In accordance with the results of Andrews and Carson (1, 4, 6, 20) we found that the symptoms caused by locking from a loose body have the highest chance of improvement. In rheumatoid arthritis, elbow arthroscopy is performed without any problems due to the ligament laxity as long as the joint is not filled with synovial tissue. Oretorp (21), who examined patients with radial epicondylitis by arthroscopy, documented pathology of the annular radial ligament.

According to our experience the best indication for elbow arthroscopy seems to be loose bodies, rheumatoid arthritis and joint infection. The procedure is also of benefit in osteochondrosis dissecans, local synovitis and mild osteoarthritis (19, 25). Contrary to the opinion of other authors (1, 3, 10, 14, 21) we feel that severe degeneration, ankylosis and unclear preoperative diagnosis are contraindications to arthroscopy. Especially in unclear arthralgia, often listed as an indication, pathologic changes were not noted arthroscopically. In our opinion arthroscopy is misused in these cases. If the diagnosis is not clear after clinical and x ray examination, sonography, computerised tomography or MRI should be performed, before therapy is instituted. Even the high costs of these diagnostic methods do not justify the performance of arthroscopy in patients with unclear diagnoses, since these exploratory arthroscopies do not clarify the diagnosis. Osseous and fibrotic ankylosis even seem to be contraindications because of the high risk of neurovascular complications and the low chance of improvement.

Attention should be paid to the high rate of neurologic complications. The surgeon should be well trained in elbow arthroscopy and confident with the anatomy. For adequate inspection of all joint compartments at least 3 portals close to the neurovascular structures have to be used (17, 27, 28).

Small (24), who published the results of 10,262 arthroscopic operations, documented a complication rate of 0% in 79 elbow arthroscopies. In contrast Lynch *et al.* (16) found 3 cases of neurologic complications in 20 elbow arthroscopies (15% complication rate). It is surprising that in regard to these anatomic conditions, neurologic complications after elbow arthroscopy are rarely published in the literature. The reason seems to be the fact that only a few surgeons, who are versed in arthroscopic operations, performed elbow arthroscopy. In the future the increase of elbow arthroscopies by inexperienced surgeons

will probably lead to an increase in complications. Very careful consideration of the benefits and the risks for each patient is therefore important. In 1986 Casscels, editor in chief of the journal "Arthroscopy", presented a similar commentary on this situation (7).

CONCLUSIONS

If the indication is justified (loose body, rheumatoid arthritis, joint infection), arthroscopy of the elbow will result in improvement. In patients with severe osteoarthritis and an unclear diagnosis, elbow arthroscopy is not indicated.

Significant pain relief can be expected, whereas other parameters (range of motion, muscle strength) are difficult to control. Due to the relatively high risk of neurologic complications, detailed preoperative information on the patient is obligatory.

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SAMENVATTING

T. SCHNEIDER, I. HOFFSTETTER, B. FINK, J. JEROSCH. Resultaten op lange termijn van arthroscopie van de elleboog bij 67 patiënten..

Zevenenzestig patiënten werden retrospectief op lange termijn resultaten van diagnostische en therapeutische arthroscopieën, tussen 1977 en 1991, geëvalueerd ; de techniek, de resultaten, de complicaties en de indicaties van de arthroscopie van de elleboog worden besproken. De gemiddelde leeftijd was 26 jaar (uitersten van 11 en 59). Bij follow-up gebeurde een klinisch en radiologisch onderzoek. De resultaten werden geëvalueerd volgens de score van Figgie, omvattend als criteria, pijn, funktie, kracht en mobiliteit.

De algemene score verbeterde van 61,6 in preoperatief tot 85,3 in postoperatief. De resultaten werden niet beïnvloed door de leeftijd van de patiënten. De zware arbeiders hadden echter een minder goed resultaat dan de anderen. Wanneer de preoperatieve pijn van 2 maanden tot 2 jaar duurde, waren de resultaten ook beter dan bij de patiënten die meer dan 2 jaar voordien klaagden.

Bij vergelijking van de verschillende criteria (pijn, funktie, kracht, mobiliteit) ziet men een opmerkelijke verbetering van de pijn wanneer de andere parameters niet relevant beïnvloed werden. Indien men de diagnose in 3 categorieën indeelt (specifieke diagnose, degeneratie, onpreciese diagnose) ziet men dat enkel de patiënten met een specifieke en preciese preoperatieve diagnose een reële verbetering vertoonden. Er werd ook een groot aantal neurologische complicaties gezien.

RÉSUMÉ

T. SCHNEIDER, I. HOFFSTETTER, B. FINK, J. JEROSCH. Résultats a long terme de l'arthroscopie du coude chez 67 malades.

Les auteurs présentent une étude rétrospective de 67 maladies, qui entre 1977 et 1991 ont subi une arthroscopie diagnostique et thérapeutique. Ils présentent la technique, les résultats, les complications et décrivent les indications de l'arthroscopie du coude. L'âge moyen était de 26 ans (extrêmes de 11 et 59). Lors de l'évaluation, l'examen clinique fut complété par un examen radiologique. Les résultats furent évalués selon les critères de Figgie, et tiennent compte de la douleur, de la fonction, de la force et de la mobilité.

On note une augmentation significative de la cotation qui passe de 61,6 en préopératoire à 85,3 en postopératoire. Les résultats ne furent pas influencés par l'âge des malades. On nota cependant des résultats moins favorables chez les travailleurs de force. Lorsque les plaintes dataient de 2 mois à 2 ans, les résultats furent meilleurs que lorsque les plaintes étaient plus anciennes. Si l'on compare les différents critères (douleur, fonction, force, mobilité), la douleur fut nettement améliorée alors que les autres paramètres n'évoluèrent pas de manière significative. Si l'on divise les diagnostics en 3 catégories (diagnostic spécifique, lésion dégénérative, diagnostic inprécis) on constate que seul les malades avec un diagnostic préopératoire spécifique et précis présentaient une amélioration notable. On constate un nombre élevé de complications neurologiques.