Endoscopic Ganglionectomy of the Elbow

Abstract: Resection of the ganglion of the elbow is indicated if the size or location of the cyst impairs function or causes significant pain. Arthroscopic decompression or endoscopic resection of the cyst is the minimally invasive surgical option. It has the potential advantage of better cosmetic results and less soft-tissue dissection. Endoscopic resection is indicated if the cyst is not communicating with the joint or the communication is not identifiable arthroscopically or if there is a long and narrow communication placing the cyst away from the elbow joint. Preoperative magnetic resonance imaging is essential for surgical planning.

A ganglion is the most common cyst lesion about the joints and can occur in nearly all anatomic locations.1 Conservative treatment is recommended for a ganglion around the elbow until the size or location of the cyst impairs function or causes significant pain.1 Open excision of the cyst is the standard surgical approach. Recently, arthroscopic excision or decompression of a ganglion cyst from the elbow has been reported.1-3 We report a technique for endoscopic resection of the ganglion cyst (Video 1). Preoperative magnetic resonance imaging (MRI) is the essential investigation for surgical planning (Fig 1).

Technique
The patient is placed in the prone position. A pneumatic tourniquet is applied at the arm and a crepe bandage is applied at the forearm distal to the ganglion sac to provide a bloodless surgical field. Fluid input is by gravity, and no arthro-pump is used. A 4.0-mm 30° arthroscope (Dyonics; Smith & Nephew Endoscopy, Andover, MA) is used for this procedure. Standard elbow arthroscopy with examination of the anterior, posterior, and lateral compartments is performed with the standard anterolateral, proximal-medial, posterocentral, posterolateral, and soft-spot portals. Any intra-articular pathology, especially around the origin of the stalk, is treated accordingly. The elbow joint is examined for any communication with the cyst. An elbow arthroscopy portal that is closest to the ganglion or its stalk and is free of risk of neurovascular damage along its tract to the ganglion and its stalk is chosen for the endoscopic ganglionectomy. The soft-spot portal was chosen in the illustrated case. A ganglion portal is made at the ganglion sac farthest from the elbow joint. The portals are coaxial and can be interchanged as the visualization and instrumentation portals by the Wissinger rod technique. The half of the sac farthest from the elbow joint is resected first by an arthroscopic shaver (Smith & Nephew Endoscopy) through the ganglion portal (Fig 2). After resection of the farthest half of the sac, the arthroscope is advanced from the soft-spot portal to the ganglion portal. The arthroscope is then removed, leaving the arthroscopic cannula in situ. A metal rod is inserted into the cannula. The cannula is then removed and reinserted along the rod through the ganglion portal. The rod is removed. The arthroscopic shaver is inserted into the cannula through the soft-spot portal (Fig 3). This step can ensure correct positioning of the arthroscope and shaver during exchange of the portals. The resection of the sac is continued from the far cut end toward the elbow joint. The stalk is identified and resected (Fig 4). Complete resection of the ganglion and the stalk is then achieved. Postoperatively, a crepe bandage is applied for 2 weeks and free mobilization of the elbow is allowed.

Discussion
Various approaches to extra-articular elbow arthroscopy have been developed to treat various pathologies,
such as lateral epicondylitis, ulnar nerve entrapment, distal biceps tendon rupture,1-6 synovial cysts,2 and olecranon bursitis. Many of the extra-articular pathologies have been treated through an intra-articular endoscopic approach. The true endoscopic extra-articular technique proceeds through an existing anatomic space or inside a space of work created de novo by the surgeon.7

Endoscopic ganglionectomy can be performed with either internal drainage/decompression of the ganglion to the joint or resection of the ganglion cyst.8 Arthroscopic decompression or resection of the cyst around
the elbow is possible only when the cyst is in proximity to the joint or there is arthroscopically identifiable communication between the joint and the cyst. It is not possible if the cyst is not communicating with the joint or the communication is not identifiable arthroscopically or if there is a long and narrow communication placing the cyst away from the elbow joint. Endoscopic resection of the cyst is indicated in these cases. Preoperative MRI is important for studying the relation between the cyst and the adjacent structures and determining the feasibility of endoscopic resection. MRI can also assist in determining which elbow arthroscopy portal can be incorporated into the endoscopic resection of the cyst. In general, the portal closest to the stalk of the cyst is used. Incorporation of the elbow arthroscopy portal in the endoscopic procedure facilitates complete resection of the stalk. It is important to keep the instruments within the boundary of the cyst during the endoscopic procedure to avoid damage to the adjacent neurovascular structures. The Wissinger rod technique is useful for safe exchange of the instruments. The resection of the cyst starts from the end farthest away from the elbow joint and proceeds toward the stalk. This can reduce the mobility of the cyst during the resection. A crepe bandage is applied to the forearm distal to the cyst, together with an arm tourniquet. This can limit the area of extravasation. Once the crepe bandage and tourniquet are removed after the procedure, the extravasated fluid will spread proximally and distally; this can minimize the soft-tissue swelling at the operated site (Table 1). The major risk of this procedure is injury to the major neurovascular structures, and it is therefore contraindicated if the cyst is in proximity to the major neurovascular structures.

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**Fig 3.** After resection of the farthest part of the cyst, the arthroscope is advanced from the soft-spot portal to the ganglion portal. The arthroscope is removed, leaving the arthroscopic cannula in situ. A metal rod is inserted into the cannula. The cannula is then removed and reinserted along the rod through the ganglion portal. The rod is removed. The arthroscopic shaver is inserted into the cannula through the soft-spot portal. This step can ensure correct positioning of the shaver and arthroscope within the ganglion sac.

**Fig 4.** (A) The half of the cyst closest to the elbow joint is resected by an arthroscopic shaver through the soft-spot portal, with the ganglion portal as the visualization portal. (B) An endoscopic view shows resection of the half of the cyst closest to the elbow joint (a), and the stalk of the sac (b) can be identified.
neurovascular structures or the surgeon is not familiar with extra-articular endoscopic surgery.

Although the described endoscopic procedure has the potential advantages of minimally invasive surgery of better cosmetic results and less soft-tissue dissection, its superiority in terms of results and security compared with the open technique cannot be shown. The endoscopic procedure in the elbow should be considered a difficult and sometimes dangerous procedure reserved for experienced elbow arthroscopists.7,10,11

In conclusion, endoscopic resection of the ganglion around the elbow is a feasible alternative to the open procedure. MRI is essential for preoperative planning.

References

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