

Endoscopic Resection of Ulnar Bursa of the Palm: 2 Ulnar Portals Technique



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Abstract: Ulnar bursa of the hand invaginates the flexor digitorum superficialis and flexor digitorum profundus tendons of the little, ring, long, and index fingers. Distension of this bursa can have an inflammatory or infective cause. It can also originate from pathology of another site (e.g., degenerative wrist joint). Because of the tough overlying palmar aponeurosis, distended ulnar bursa can have swelling at a remote site. The distended ulnar bursa can also have compressive neuropathy to the ulnar nerve and median nerve. The purpose of this Technical Note is to describe the technical details of the 2 ulnar portals technique involving endoscopic resection of the ulnar bursa. This is indicated for symptomatic distension of the ulnar bursa, especially with hypothenar extension.

Ulnar bursa of the hand invaginates the flexor digitorum superficialis and flexor digitorum profundus tendons of the little, ring, long, and index fingers.¹ The ulnar bursa communicates with the fifth flexor digitorum tendon sheath in 50% to 80% of cases but usually not with the other flexor tendon sheath.² Distension of this bursa can have an inflammatory (e.g., rheumatoid arthritis,^{3,4} pigmented villonodular synovitis⁵) or an infective (suppurative⁶⁻⁸ or tuberculous⁹) cause. It can also originate from pathology of another site (e.g., degenerative wrist joint).^{10,11} Because of the tough overlying palmar aponeurosis, distended ulnar bursa can have swelling at a remote site (Fig 1).^{2,10,11} The distended ulnar bursa can also have compressive neuropathy to the ulnar nerve and median nerve.^{1,12,13}

Classically, operation of the ulnar bursa requires an open approach.¹⁴ This may result in extensive soft tissue dissection and scarring. Recently, an endoscopic approach to the ulnar bursa had been reported.^{15,16} This minimally invasive approach with small incisions allows aggressive post-operative hand therapy and avoids the complication of tendon adhesions, joint contractures, and hand stiffness.^{14,17} The reported endoscopic techniques use the ulnar palmar portal and first web portal. The purpose of this Technical Note is to describe the technical details of a modification of the techniques using 2 ulnar portals. It is indicated for symptomatic distension of the ulnar bursa, especially with hypothenar extension. It is contraindicated in the case of pigmented villonodular synovitis that is extended into the carpal tunnel. An open approach is needed to ensure complete synovectomy. It is also contraindicated if there is evidence of compartment syndrome of the hand. Open release is a more appropriate treatment option (Table 1).

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The authors report no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

Received May 27, 2023; accepted June 15, 2023.

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2212-6287/23766

<https://doi.org/10.1016/j.eats.2023.06.004>

Technique

1. Preoperative Planning and Patient Positioning

Suppurative infection of the ulnar bursa is a surgical emergency and should not wait for imaging investigations.⁶ In a subacute or chronic condition, magnetic resonance imaging (MRI) can define the extent and nature of the lesion (Fig 2). MRI can also detect any remote origin (e.g., the wrist joint).^{2,10,11}

The patient is in the supine position with the hand on the side table. An arm tourniquet is applied to provide a

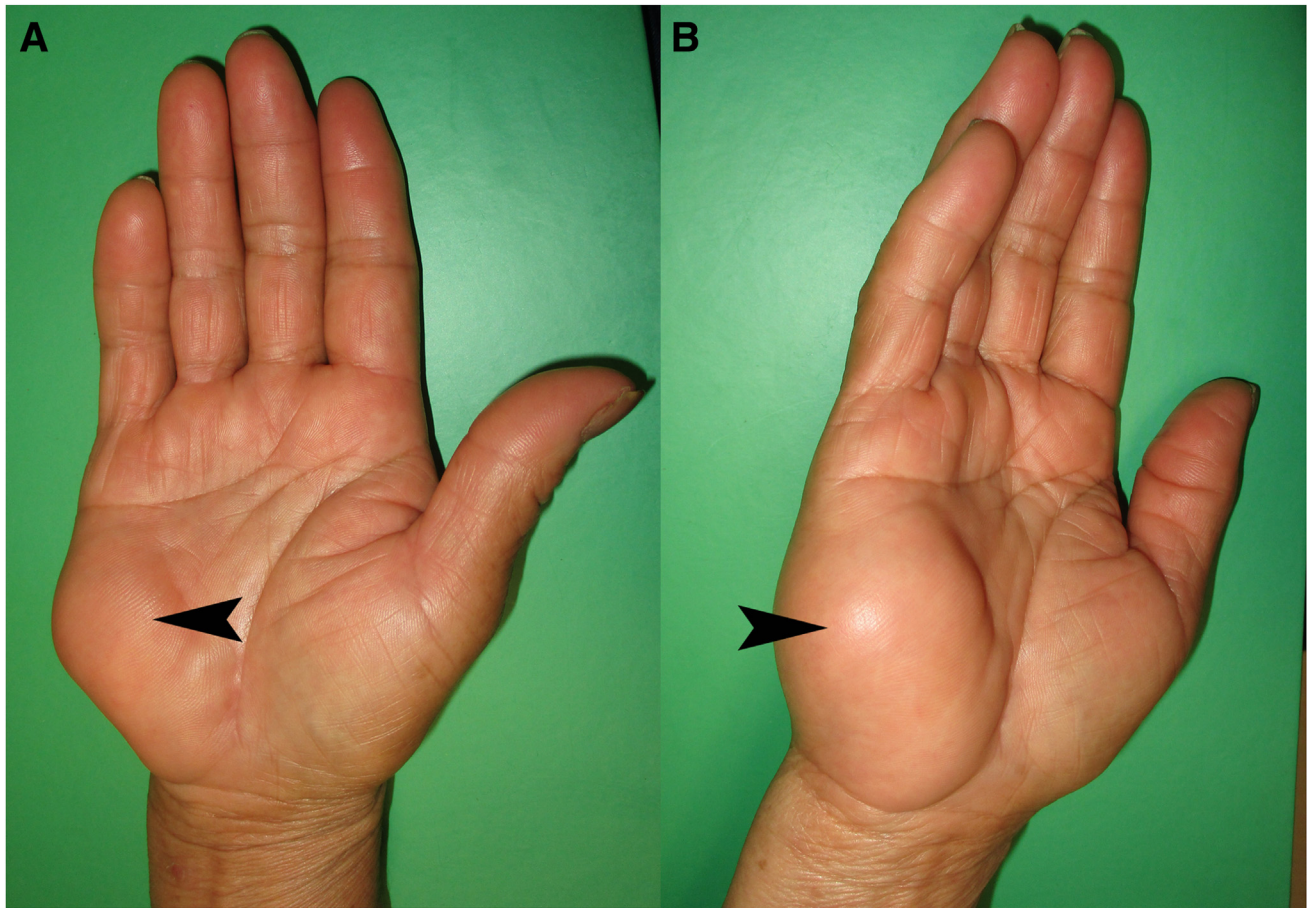


Fig. 1. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. Clinical photos of the illustrated case show that the distended ulnar bursa is manifested as a swelling at the hypothenar region (arrowhead). (A) Anteroposterior view. (B) Oblique view.

bloodless surgical field. Fluid inflow is by gravity, and no arthropump is used. A 2.7-mm 30° arthroscope (Henke Sass Wolf GmbH) is used for this procedure.

2. Portal Placement

This procedure is performed via the proximal ulnar and distal ulnar portals, which are at the ulnar border of the hypothenar eminence and 2 cm and 5 cm distal to the hook of hamate, respectively (Fig 3).

3. Resection of Hypothenar Extension of the Ulnar Bursa

A 3- to 4-mm skin incision is made at the portal sites, and the underlying subcutaneous tissue is bluntly dissected with a hemostat down to the

hypothenar extension of the ulnar bursa. The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. The hypothenar extension of the ulnar bursa is resected with an arthroscopic shaver (Dyonics; Smith and Nephew) (Fig 4). Caution should be paid not to injure the superficial branch of the ulnar nerve. After resection of this part of the ulnar bursa, the underlying hypothenar muscles are exposed.

4. Identification of the Flexor Digitorum Superficialis Tendon of the Little Finger

The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. The radial edge of the hypothenar muscles is bluntly dissected

Table 1. Indications and Contraindications of Endoscopic Resection of Ulnar Bursa of the Palm: 2 Ulnar Portals Technique

Indications	Contraindications
1) Symptomatic distension of the ulnar bursa, especially with hypothenar extension	1) Pigmented villonodular synovitis that is extended into carpal tunnel 2) Compartment syndrome of the hand

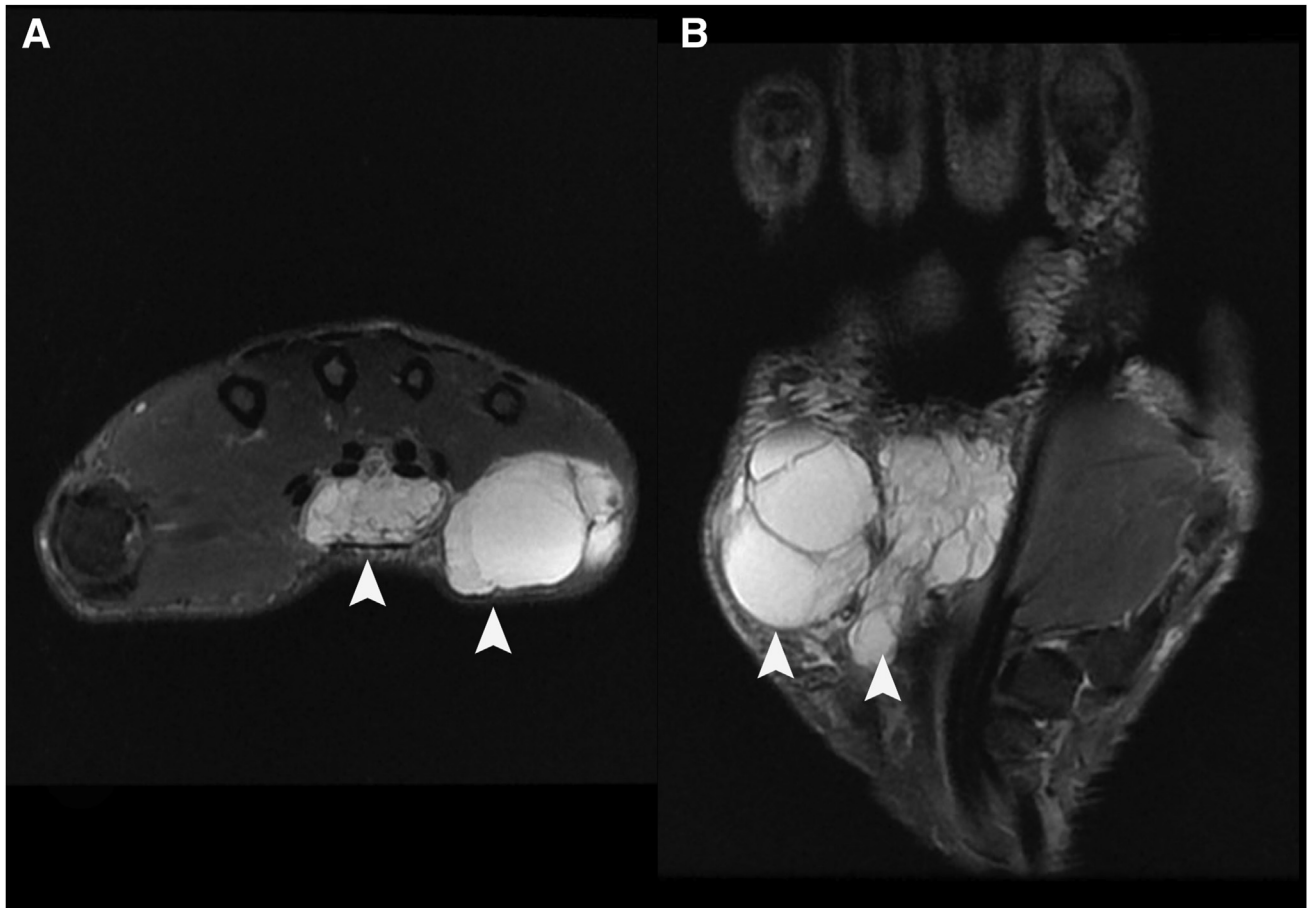


Fig. 2. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. Magnetic resonance images of the illustrated case show distended multiloculated ulnar bursa with hypothenar extension (arrowheads). (A) Transverse image. (B) Coronal image.

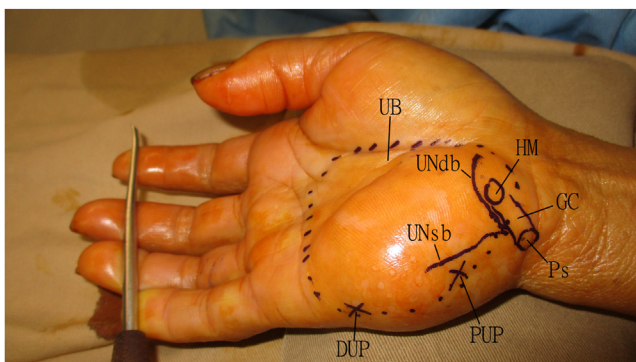


Fig. 3. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. This procedure is performed via the proximal ulnar and distal ulnar portals, which are at the ulnar border of the hypothenar eminence and 2 cm and 5 cm distal to the hook of hamate, respectively. (DUP, distal ulnar portal; GC, Guyon canal; HM, hook of hamate; Ps, pisiform; PUP, proximal ulnar portal; UB, ulnar bursa; UNdb, deep branch of ulnar nerve; UNsb, superficial branch of ulnar nerve.)

with a hemostat to expose the flexor digitorum superficialis tendon of the little finger. This is the anatomic landmark of the ulnar edge of the ulnar bursa (Fig 5).

5. Resection of the Distal Part of the Ulnar Bursa

The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. The distal part of the ulnar bursa is resected with the arthroscopic shaver and arthroscopic punch (Arthrex) (Fig 6). It is important not to dissect toward the palmar aponeurosis to reduce the risk of injury to the superficial palmar arch and digital nerves.¹⁶

6. Identification of the Thenar Muscles and Flexor Pollicis Longus Tendon

The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. Resection of ulnar bursa proceeds from the ulnar to the radial direction until the thenar muscles and flexor pollicis longus tendon are identified (Fig 7). These structures

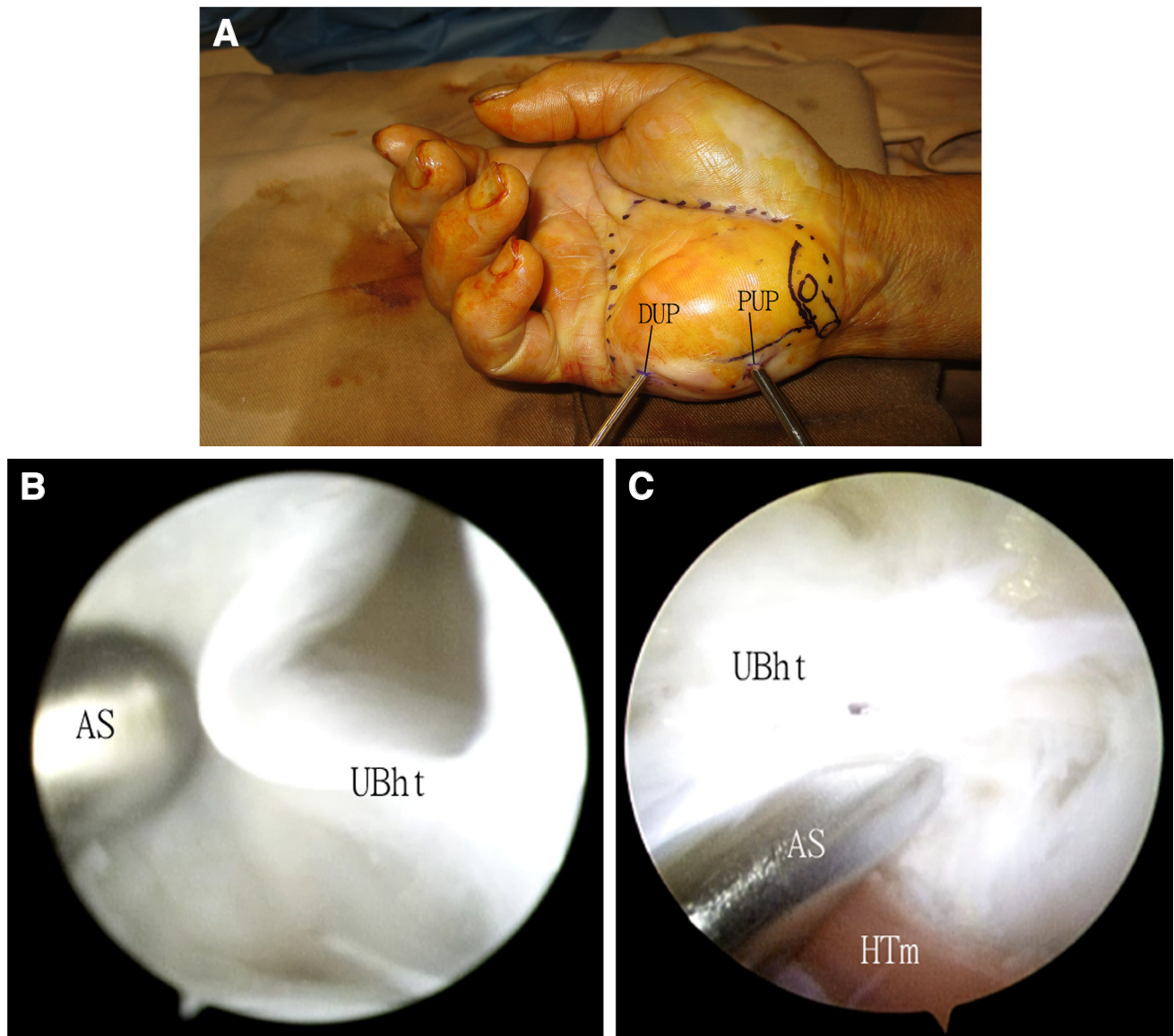


Fig. 4. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. (A) Clinical photo of resection of the hypothenar extension of the ulnar bursa. (B) Endoscopic photo of resection of the hypothenar extension of the ulnar bursa. (C) After resection of this part of the ulnar bursa, the underlying hypothenar muscles are exposed. (AS, arthroscopic shaver; DUP, distal ulnar portal; HTm, hypothenar muscles; PUP, proximal ulnar portal; Ubht, hypothenar extension of the ulnar bursa.)

are the anatomic landmark of the radial edge of the ulnar bursa.

7. Resection of the Proximal Part of the Ulnar Bursa

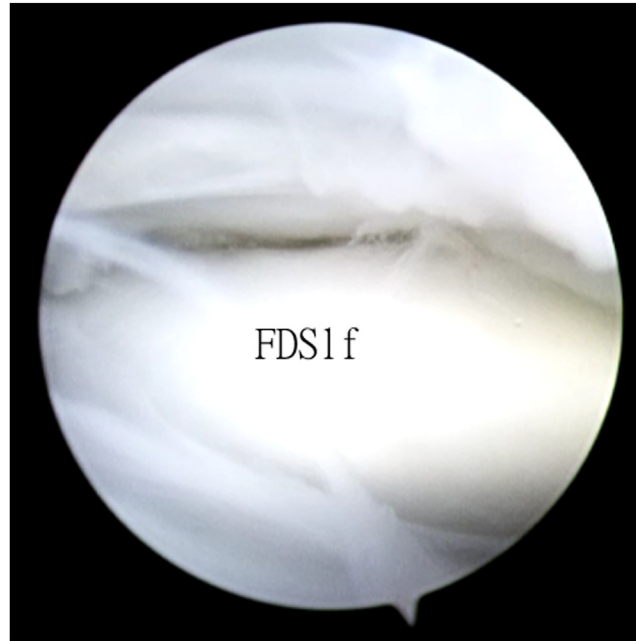
The distal ulnar portal is the viewing portal, and the proximal ulnar portal is the working portal. The proximal part of the ulnar bursa is resected with the arthroscopic shaver and arthroscopic punch. Extreme care should be paid to preserve the median nerve, which is superficial to the flexor tendons and ulnar

bursa. One should not breach the fascia covering the metacarpals and interossei to avoid injury to the deep palmar arch and deep branch of the ulnar nerve (Fig 8, Video 1, Table 2).¹⁶

Discussion

It is important to investigate any remote source of the distended ulnar bursa. Operative excision of the bursa alone is likely to be followed rapidly by recurrence,

Fig. 5. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. The radial edge of the hypothenar muscles is bluntly dissected with a hemostat to expose the flexor digitorum superficialis tendon of the little finger. This is the anatomic landmark of the ulnar edge of the ulnar bursa. (FDS1f, flexor digitorum superficialis tendon of the little finger.)



since the fluid originates in the wrist joint and closure of the capsular perforation of the wrist joint may be indicated, although secure healing is uncertain in the presence of degenerative arthritis.^{10,11}

For the original endoscopic techniques, the portals used are at the level of the metacarpal necks.^{15,16} Turning of the arthroscope and arthroscopic

instrument toward the proximal part of the ulnar bursa can be hindered by the second and fifth metacarpal heads. In this modified technique, the use of the proximal ulnar portal can solve this problem.

In the proximal part of the ulnar bursa, the median nerve is superficial to the bursa and may adhere to the bursa by a layer of cellulo-adipose tissue.¹⁸ To avoid

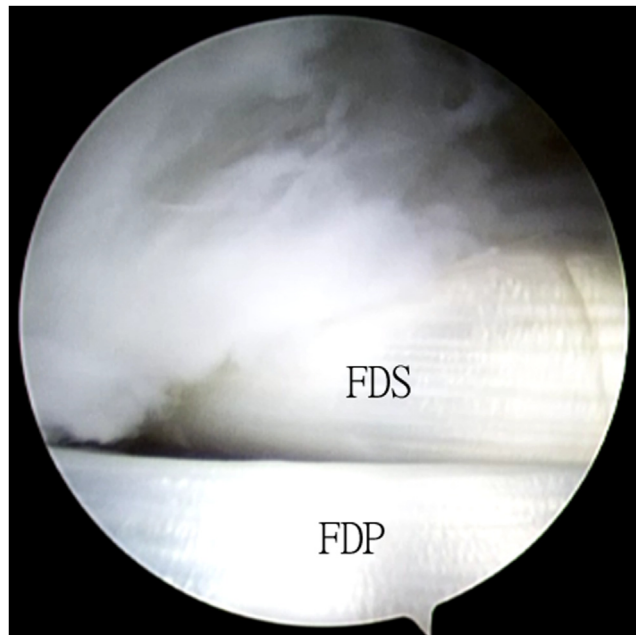


Fig. 6. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. The distal part of the ulnar bursa is resected with the arthroscopic shaver and arthroscopic punch. (FDP, flexor digitorum profundus tendon; FDS, flexor digitorum superficialis tendon.)

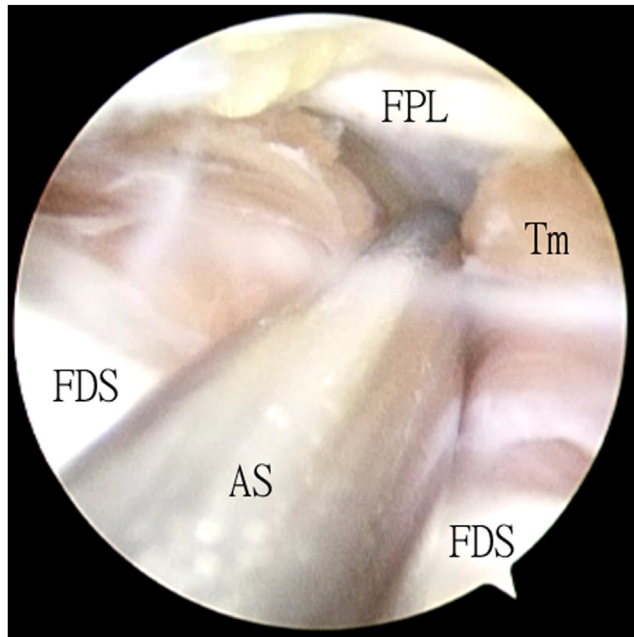


Fig. 7. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. The proximal ulnar portal is the viewing portal, and the distal ulnar portal is the working portal. Resection of the ulnar bursa proceeds from the ulnar to the radial direction until the thenar muscles and flexor pollicis longus tendon are identified. These structures are the anatomic landmark of the radial edge of the ulnar bursa. (AS: arthroscopic shaver; FDS, flexor digitorum superficialis tendon; FPL, flexor pollicis longus tendon; Tm, thenar muscles.)

injury to the median nerve, the nerve should be dissected out before resection of the proximal part of the ulnar bursa. As the superficialis and profundus tendons of the index finger lie immediately dorsal to the median nerve, observation of tendon motion by

passively moving the patient's index finger can help to locate the median nerve.¹⁸

The advantages of this arthroscopic technique include better cosmesis, less soft tissue dissection, less post-operative pain, complete assessment of the subfascial

Fig. 8. Endoscopic resection of ulnar bursa of the right palm: 2 ulnar portals technique. The patient is in the supine position with the hand on the side table. The distal ulnar portal is the viewing portal, and the proximal ulnar portal is the working portal. The proximal part of the ulnar bursa is resected with the arthroscopic shaver and arthroscopic punch. (AS, arthroscopic shaver; FDP, flexor digitorum profundus tendon; FDS, flexor digitorum superficialis tendon.)

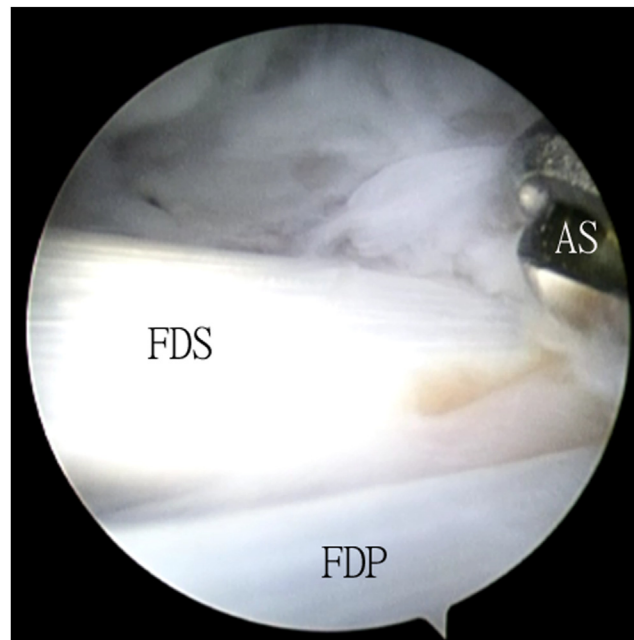


Table 2. Pearls and Pitfalls of Endoscopic Resection of Ulnar Bursa of the Palm: 2 Ulnar Portals Technique

Pearls	Pitfalls
1) Creation of the proximal ulnar portal facilitates resection of the proximal part of the ulnar bursa.	1) The fascia covering the metacarpals and interossei should not be breached.
2) Observation of tendon motion by passively moving the patient's index finger can help to locate the median nerve before resection of the proximal part of the ulnar bursa.	2) Debridement toward the palmar aponeurosis should be avoided.

Table 3. Advantages and Risks of Endoscopic Resection of Ulnar Bursa of the Palm: 2 Ulnar Portals Technique

Advantages	Risks
1) Better cosmesis	1) Injury to the superficial and deep palmar arches
2) Less soft tissue dissection	2) Injury to the superficial and deep branches of ulnar nerve
3) Less postoperative pain	3) Injury to the digital nerves
4) Complete assessment of the subfascial spaces	4) Injury to the median nerve
5) Avoidance of exposed tendons or nerve	5) Injury to the flexor tendons
6) Adequate resection of the ulnar bursa	6) Compartment syndrome
7) Allowance of immediate postoperative vigorous hand therapy	

spaces, avoidance of exposed tendons or nerve, adequate resection of the ulnar bursa, and allowance of immediate postoperative vigorous hand therapy. The potential risks of this procedure include injury to the superficial and deep palmar arches, superficial and deep branches of ulnar nerve, digital nerves, median nerve and flexor tendons, and compartment syndrome (Table 3). This is a technically demanding procedure and should be reserved for experienced hand and wrist arthroscopists.

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