



Case report

Interphalangeal arthroscopy of the toes



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ABSTRACT

Interphalangeal (IP) joint pathology of the toes has gained little attention of the orthopedic surgeon. However, similar intra-articular pathologies e.g. osteoarthritis, synovitis, chondral lesion, arthrofibrosis and instability can occur as in other joints. Moreover, many corrective procedures of toe deformity involved excisional arthroplasty or arthrodesis of the IP joint although it is not the site of primary pathology. Classically, the operations of the IP joint were performed in an open manner. We described the technique of interphalangeal arthroscopy and its application to treat various pathologies of the interphalangeal joint was discussed. Among the various indications for interphalangeal arthroscopy, arthroscopic ganglionectomy of recurrent IP ganglion is the single most important one.

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1. Introduction

Interphalangeal (IP) joint pathology of the toes has gained little attention of the orthopedic surgeon. However, similar intra-articular pathologies e.g. osteoarthritis, synovitis, chondral lesion, arthrofibrosis and instability can occur as in other joints. Moreover, many corrective procedures of toe deformity involved excisional arthroplasty or arthrodesis of the IP joint although it is not the site of primary pathology. Classically, the operations of the IP joint were performed in an open manner. With the advance in small joint arthroscopy, many of the small joints of the foot and ankle can be approached arthroscopically. We described our technique of interphalangeal arthroscopy and its application to treat various pathologies of the interphalangeal joint was discussed below.

2. Description of technique

The patient was in supine position with a thigh pneumatic tourniquet to maintain a bloodless field. The dorsomedial and dorsolateral portal wounds were made at the dorsomedial and dorsolateral corners of the interphalangeal joint. The subcutaneous tissue is bluntly dissected down to the joint capsule with a hameostat in order to avoid damage to the dorsal digital nerve. The capsule is penetrated with the trocar. It is important to avoid damage to the lateral slips of the tendon expansion. The direction of introduction

should be along the dorsal recess and should not be pointed to the joint proper in order to avoid iatrogenic damage of the articular cartilage. 1.9 mm 30° arthroscope was used and the dorsal capsule and recess can be examined (Fig. 1). In order to avoid cartilage damage during the arthroscopy, visualization should primarily be obtained by extending and flexing the joint, rather than trying to force the arthroscope into the narrow joint space. The joint can be distracted manually to improve the visual field. Plantar lateral portal can be established in case of plantar procedure is indicated e.g. arthroscopic synovectomy of the plantar gutter. The portal was located at the plantar lateral corner of the joint with a needle before making the portal wound (Fig. 2). The location of the portal can also be modified according to the procedure done (Fig. 3).

3. Case series

Since May 2008, 22 interphalangeal arthroscopies were performed in 20 patients with mean follow-up of 48 (11–67) months. There were two stiff toes with capsular contracture of proximal IP joints in one patient (Fig. 4), 1 case of osteoarthritis (Fig. 5), 1 case of irreducible interphalangeal dislocation of the great toe by incarcerated sesamoid bone (Fig. 6), 5 fixed claw toes deformity in 4 patients (Fig. 7), 2 cases of synovitis, 2 cases of post-polio cock up deformity of the great toe (Fig. 8), 7 cases of recurrent ganglion and 2 cases of osteochondral lesion. The clinical details were summarized in Table 1. Associated synovitis and dorsal capsular fibrosis of the IP joint was seen in all cases of recurrent ganglion. Cartilage fibrillation was seen in two of them. No intraoperative or postoperative complications were encountered.

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Table 1
Details of patients with interphalangeal arthroscopy performed.

Patient	Gender/age (years)	Patient's symptom	Pathology	Treatment	Duration of follow up (months)	Results
1	34/F	Pain and tenderness at PIPJ of 2nd toe	Synovitis of the PIPJ of 2nd toe	Arthroscopic synovectomy	58	Pain and swelling subsided
2	44/F	Pain and tenderness at the IPJ of the great toe	Synovitis of the IPJ of the great toe	Arthroscopic synovectomy	50	Pain and swelling subsided
3	46/F		Fixed claw toe deformity of 2nd and 3rd toe	Arthroscopic excision of proximal phalangeal condyle	63	Claw toe deformity corrected with stiff interphalangeal joint
4	45/F		Fixed claw toe of 2nd toe	Arthroscopic excision of proximal phalangeal condyle	59	Claw toe deformity corrected with stiff interphalangeal joint
5	50/F		Fixed claw toe of 2nd toe	Arthroscopic excision of proximal phalangeal condyle	56	Claw toe deformity corrected with stiff interphalangeal joint
6	62/F		Fixed claw toe of 2nd toe	Arthroscopic excision of proximal phalangeal condyle	55	Claw toe deformity corrected with stiff interphalangeal joint
7	44/M	Stiffness of the 4th toe	Osteoarthritis of the PIPJ of 4th toe	Arthroscopic decompression	51	Flexion range improved from 40° to 90° with mild pain on end flexion.
8	20/M	Stiff 2nd and 3rd toe PIP joints with stiffness discomfort	Post-traumatic dorsal capsular contracture with fibrotic mass of the IPJs	Arthroscopic capsular release and debulking of the fibrotic mass	51	Flexion range improved from 0° to 40°. The preoperative stiffness discomfort improved after the operation
9	39/M		Post polio claw great toe	Arthroscopic assisted Jone's procedure	67	Deformity corrected with solid IPJ fusion
10	23/F		Post polio claw great toe	Arthroscopic assisted Jone's procedure	51	Deformity corrected with solid IPJ fusion
11	61/F		Recurrent dorsal ganglion of IPJ of the great toe (two open excisions before)	Arthroscopic ganglionectomy	59	No recurrence
12	44/F		Recurrent dorsal ganglion of IPJ of the great toe (one open excision before)	Arthroscopic ganglionectomy	57	No recurrence
13	20/M		5 mm × 3 mm osteochondral lesion at dorsal half of the condyle of the PIPJ of the 2nd toe	Arthroscopic removal of loose body, synovectomy and microfracture of the lesion	67	The pain improved initially but recurred 2 years later with X-rays showed degenerative change of the joint. Patient refused further operation as the pain was tolerable and not affect his work or sport
14	71/F		Extensive osteochondral lesion of the PIPJ of the 2nd toe with nearly the whole cartilage cap of the proximal phalangeal condyle detached	Arthroscopic debridement	56	Pain improved although X-rays showed osteophytes formation
15	54/M		Irreducible IPJ dislocation of the great toe	Arthroscopic reduction of the sesamoid bone	49	IPJ reduced but there was pain during push off phase of the walking. X-rays showed plantar opening up of the joint. The joint was stiff
16	63/M		Recurrent dorsal ganglion of PIPJ of the 2nd toe (one open excision before)	Arthroscopic ganglionectomy	40	No recurrence
17	44/M		Recurrent dorsal ganglion of DIPJ of the 2nd toe (three open excision before)	Arthroscopic ganglionectomy	28	No recurrence
18	70/F		Recurrent dorsal ganglion of IPJ of the great toe (two open excision before)	Arthroscopic ganglionectomy	20	No recurrence
19	41/M		Recurrent dorsal ganglion of IPJ of the great toe (one open excision before)	Arthroscopic ganglionectomy	12	No recurrence
20	54/F		Recurrent dorsal ganglion of IPJ of the great toe (two open excision before)	Arthroscopic ganglionectomy	11	No recurrence

PIPJ: proximal interphalangeal joint; DIPJ: distal interphalangeal joint; IPJ: interphalangeal joint.

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