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Original Article

Carpal Tunnel Syndrome Caused by Gout: Clinical Presentations, Surgical Findings, and Outcomes After Surgery
痛風引起腕管道綜合症的臨床表現、手術發現和術後結果

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ABSTRACT

Background/Purpose: Carpal tunnel syndrome caused by gout is rare. We presented our experience in treating these patients.
Methods: We conducted a retrospective review of cases treated from 2010 to 2013. Eight patients were identified out of 348 carpal tunnel releases performed.
Results: All patients were male. All patients had gouty tophi on the same hand and other locations on the body. Open carpal tunnel release was performed on all patients. There was gouty tenosynovitis in all patients but no encasement of the median nerve. The mean follow-up was 16 months. Numbness improved in seven out of eight patients.
Conclusion: Gout should be considered a cause of carpal tunnel syndrome, particularly in patient with a history of gout. Early surgical outcome is promising. Longer follow-up is needed to detect recurrence.

中 文 摘 要

簡介: 由痛風引起的腕管道綜合症並不常見。我們報告了有關治療這些病者的經驗。
方法: 這是一個回顧性的研究。我們收集了從2010至2013年間因腕管道綜合症接受治療的病例，發現有八位病者是由痛風引起的。
結果: 所有病者都是男性。所有病者都在身體的不同部位發現有痛風石。手術發現所有病者都受痛風所引起的腱鞘炎影響。但是正中神經並沒有直接受到痛風侵害。我們平均跟進病人十六個月。八個病者之中有七位的手部麻痺減輕了。
結論: 痛風可以作為腕管道綜合症的成因之一。在有痛風病歷的腕管道綜合症病者中更特別留神。術後初期病人康復良好。需要更長期跟進才可獲知復發機會。

Introduction

Both gout and carpal tunnel syndrome are common disease entities in our region. However, gout is a rare cause of carpal tunnel syndrome. A few papers describe the condition and most were case reports.[1–4] We have encountered several cases in recent years. Our present study focused on these patients' characteristics, clinical presentation, surgical findings, and outcomes after surgery. We also review the current literature on this entity to better understand its pathology and to raise the awareness of gout as a cause of carpal tunnel syndrome, to facilitate diagnosis and treatment.

Materials and methods

We conducted a retrospective review of the cases of carpal tunnel syndrome treated in our centre from 2010 to early 2013. Patients with a diagnosis of carpal tunnel syndrome and gout were included. A total of 348 operations were performed for carpal tunnel syndrome. Eight patients had carpal tunnel syndrome related to gout. All diagnoses were confirmed by intraoperative findings and histology of specimens obtained during the operation, which demonstrated gouty deposits.

Results

The clinical characteristics of the patients are summarized in Table 1. All patients were male with an average age of 56 years. They

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Table 1
Summary of cases with carpal tunnel syndrome associated with gout

Case no.	Sex	Age (y)	Side	History of gout (y)	Duration of symptoms (mo)	Preop urate level (mmol/L)	Symptoms and signs besides numbness	Tophi at other areas
1	M	41	Right	10	2	0.73	Finger stiffness, volar swelling, dorsal ulnar mass, wrist pain	Yes
2	M	64	Right	4	24	0.67	Finger stiffness, volar swelling, thenar wasting	Yes
3	M	62	Right	10	12	0.65	Mild volar swelling, thenar wasting	Yes
4	M	70	Left	20	12	0.62	Thumb locked in extension, volar swelling, thenar wasting	Yes
5	M	40	Left	15	12	0.74	Index finger locked in flexion, volar and dorsal firm mass	Yes
6	M	71	Right	15	24	0.55	Finger stiffness, vague volar swelling, thenar wasting	Yes
7	M	72	Right	5	24	0.66	Index finger stiffness, volar swelling, thenar wasting	Yes
8	M	28	Right	5	2	0.75	Thumb locked in flexion, volar mass, wrist pain	Yes

had a history of gout for an average of 11 years. Seven of them had hypertension and four had hyperlipidaemia. The right hand was involved in six patients and the left hand in the other two patients. The average postoperative follow-up was 16 months.

Most patients presented with chronic carpal tunnel syndrome with an average 15 months of symptoms characterised by numbness with or without pain. Two patients presented acutely with < 3 months of symptoms. Five of the patients had thenar wasting and poor thumb abduction. For associated symptoms, all patients had gouty tophi of the same hand and other locations. Finger stiffness or locking was also noted in seven patients. Physical examination revealed ill-defined volar swelling in five patients and firm masses in three patients. Nerve conduction was done in four patients showing significant delay in sensory and motor latency of at least grade five according to Bland's grading. Magnetic resonance imaging (MRI) and/or ultrasound of the wrist was done in three patients for investigation of wrist swellings. All patients had elevated preoperative blood urate levels with an average of 0.67 mmol/L.

All patients received open carpal tunnel release and additional surgery (Table 2). The operative findings are summarized in Table 3. During the operation, the median nerve was compressed by the transverse carpal ligament and also by the mass effect related to structures within the carpal tunnel. All patients had hourglass deformity of the median nerve and tenosynovitis of the tendons due to gouty deposition. However, none of them had deposition directly on the median nerve. Tophi infiltration of the flexor tendon leading to mass effect and causing locking of finger motion was noted in four patients with either flexor digitorum superficialis (FDS) or flexor pollicis longus (FPL) being involved. Protrusion of tophi from the wrist joint or intercarpal joint into the carpal tunnel was also noted in four patients.

Open carpal tunnel release was performed in all patients. Additional procedures were performed at the same time to efficiently decompress the carpal tunnel and improve hand function. A summary of the procedures is listed in Table 4. All patients received flexor tenosynovectomy. Flexor tendons with gouty infiltration received debulking with or without tubularisation. The carpal tunnel floor was explored to ensure clearance of gouty tophi. Opponensplasty with either the palmaris longus tendon or the FDS ring finger was performed on patients with weakness in thumb abduction.

Some of the patients also received concomitant surgeries at locations other than the carpal tunnel on the same hand or on other parts of the body. Examples include excision of tophi from other finger joints, extensor tendons, and the elbow and toe (Table 2).

The mean follow-up period was 16 months. Seven out of eight patients had improvement of finger numbness. All four patients with finger triggering showed resolution of triggering and improvement in finger movement. Antihyperuricaemic treatment was continued for all patients. Allopurinol and colchicine were prescribed. Probenecid was used in patients with allergy to allopurinol (allergy was noted in 2 patients). The average urate level at follow-up was 0.44 mmol/L, excluding one patient who was not compliant with treatment. None of the cases suffered from wound infection.

Complications occurred in three out of eight cases (37.5%). One patient had a flare-up of gout at 1 month after the operation, characterised by marked swelling and wrist pain. There was no

Table 2
Intraoperative findings, operation and results

Case no.	Intraoperative findings	Primary surgery besides open carpal tunnel release	Concomitant surgery	Improvement of numbness and range or movement of finger	Complication
1	Tenosynovitis, tophi from floor	Tenosynovectomy, floor clearance	Excision of tophi middle finger PIPJ	Both	Nil
2	Tenosynovitis, tophi from floor, tophi infiltration of FDS I/F, M/F.	Neurolysis, tenosynovectomy, debulking FDS, floor clearance, Camitz transfer	Extensor synovectomy same hand excision tophi R G/T, L olecranon	Both	Nil
3	Tenosynovitis	Tenosynovectomy, Camitz transfer	Nil	Numbness improved but recurrence 2 y later	MRI tophi infiltration of FDS
4	Tenosynovitis, FPL infiltration in palm and also in A1pulley	Tenosynovectomy, debulking FPL at both sites, A1 pulley repair, Camitz transfer	R olecranon tophi excision, tophi excision dorsal MCPJ M/F	Both	Painful scar
5	Tenosynovitis, tophi infiltration of FDS I/F	Neurolysis, tenosynovectomy, Debulking FDS	Debulking tophi at ECRL/ECRB, excision tophi at olecranon	Both	Nil
6	Tenosynovitis, tophi from floor	Neurolysis, tenosynovectomy, floor clearance, FDS IV transfer	Nil	Both	Flare-up of gout
7	Tenosynovitis, tophi from floor	Neurolysis, tenosynovectomy, floor clearance, Camitz transfer	Nil	Both	Nil
8	Tenosynovitis, tophi infiltrating FPL	Neurolysis, tenosynovectomy, Debulking FPL	Excision tophi at olecranon	Both	Nil

FDS = flexor digitorum superficialis; FPL = flexor pollicis longus; MRI = magnetic resonance imaging; ECRL = extensor carpi radialis longus; ECRB = extensor carpi radialis brevis; MCPJ = metacarpalphalangeal joint; R G/T = right great toe; L = left; I/F = index finger; M/F = middle finger.