



Functional outcome of De Quervain's tenosynovitis with longitudinal incision in surgically treated patients

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Received: 15 October 2017 / Accepted: 9 December 2018 / Published online: 1 January 2019
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Abstract

Introduction De Quervain described tenosynovitis of first dorsal compartment more than 120 years ago. Women, particularly of 4th–5th decades, are at more risk of developing disease. Steroid injection has been described as first line of management over many decades, but it is associated with some significant complications like depigmentation of skin, atrophy of subcutaneous tissue, suppurative tenosynovitis and even tendon rupture. Animal studies have also reported increased risk of peritendinous adhesions with steroid injection.

Materials and methods We prospectively managed 46 cases of De Quervain's tenosynovitis with longitudinal incision at tertiary care hospital from 2014 to 2016. There were totally 40 patients with 9 males and 31 females between age group of 28 and 62 years. All patients were evaluated using DASH and VAS scores preoperatively and post-operatively.

Results The mean preoperative DASH score was 42.26 which reduced to 5.37 post-operatively. The mean preoperative VAS score was 7.30 which reduced to 2.33 post-operatively. Intraoperatively, we found peritendinous adhesions in 8 patients and ganglion arising from first dorsal compartment in one patient. Post-operatively, we found hypertrophic scar in 3 patients and persistent numbness to first dorsal web space due to injury to superficial radial nerve in 2 patients. Six patients had recurrent symptoms and required revision surgery.

Conclusion Surgical release of De Quervain's tenosynovitis remains the gold standard treatment, and longitudinal incision offers advantage of easy identification of compartment, more complete releases of tendon sheath and peritendinous adhesions and less risk of palmar subluxation of tendons.

Keywords De Quervain · Surgery · Longitudinal incision · Functional outcome

Introduction

In 1895, Swiss surgeon Fritz de Quervain first described the tenosynovitis of first dorsal compartment involving the tendons of abductor pollicis longus and extensor pollicis brevis [1]. Women are more commonly affected than men, particularly in 4th and 5th decades, with estimated prevalence being 1.3% in women and 0.5% in men in large UK-based study [2]. The disease is found to be more common during and after pregnancy, most likely due to fluid retention and hormonal changes [3, 4]. Various occupational risk factors have also been described in working population who are engaged in repetitive wrist bending and twisting movements [5]. The disease was initially thought to be of inflammatory origin, but histological study has shown that intrinsic degenerative changes due to accumulation of mucopolysaccharides in tendon sheath lead to thickening of tendon sheath of first dorsal compartment which effectively reduces the volume of first

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Fig. 1 Skin incision mark on radial styloid

dorsal compartment [6]. The diagnosis of De Quervain tenosynovitis is based on history and clinical examination. Presence of tenderness at radial styloid and positive Finkelstein test, which includes adduction of thumb and ulnar deviation of wrist, is considered to be pathognomonic for diagnosis of De Quervain's disease [7]. Recently, ultrasonographic examinations of wrist in symptomatic patient have increased accuracy of diagnosis and also provide useful information regarding anatomical variations [8, 9].

Materials and methods

A prospective study comprising 46 hands of 40 patients was conducted at tertiary care hospital from 2014 to 2016. Informed consent was taken from all patients included in the study. An ethical committee approval was obtained from the Ethical Committee of B. J. Medical College, Pune, prior to initiate the study. All patients presenting with wrist pain were evaluated for De Quervain's tenosynovitis by the presence of tenderness over radial styloid and positive Finkelstein test. Any history of traumatic origin of pain was excluded. All patients with suspected De Quervain's tenosynovitis underwent local ultrasound and radiographs of wrist on affected side. Patients were initially managed conservatively with non-steroidal anti-inflammatory medicines, splints and one local corticosteroid (1 ml of 40 mg triamcinolone) injection to affected extremity. Those who complain of persistent disabling pain after 4–6 weeks of conservative management were offered surgery. All patients those met inclusion criteria were evaluated with haematological investigations like complete blood count, random blood sugar level, rheumatoid factor and C-reactive protein. Written and informed consent for surgery was taken. Surgery was done in local anaesthesia after proper scrubbing and draping of affected part. A 2–3-cm longitudinal skin incision (Fig. 1) was taken over radial styloid, subcutaneous tissue was dissected, and superficial radial nerve was identified and retracted laterally (Fig. 2). The tendons of first dorsal compartment (abductor pollicis longus and extensor pollicis brevis) were identified, and overlying thickened tendon sheath was identified (Fig. 3) and incised longitudinally



Fig. 2 Skin incision deepens, showing blood vessel overlying tendon sheath



Fig. 3 Blood vessel retracted medially, showing thickened tendon sheath of first dorsal compartment



Fig. 4 Tendon sheath overlying APL and EPB was dissected away and incised parallel to these tendons

(Fig. 4) parallel to these tendons. Any adhesion to tendon mobility was identified by asking the patient to do active thumb movement, and both tendons were freed from any adhesion (Fig. 5). Wound was thoroughly washed with normal saline, and skin was closed using 3-0 nonabsorbable suture. A well-padded dressing was applied for 2 days along with oral antibiotics and non-steroidal anti-inflammatory medicines. Wound check was done at second post-operative day, and dressing was reduced to a small dynaplast dressing.



Fig. 5 Tendons of APL and EPB were freed from peritendinous adhesions and looked for free movement

Patient was allowed to do routine household activities as tolerated. Suture removal was done at 10th post-operative day. All patients were operated by same surgeon. All patients were evaluated with disability of arm, shoulder and hand (DASH) score and visual analogue score (VAS) for functional outcome at 3 months.

Result

The study consists of 40 patients with 9 males and 31 females of age group between 28 and 62 years (mean age—39 + - 5.7 years). There were totally 7 patients diagnosed with rheumatoid arthritis out of which 6 patients had bilateral hand involvement. Out of 46 hands that were included in study, 32 were on dominant side and 14 involve non-dominant hands. Five patients had associated trigger finger which was also managed with surgical release of A1 pulley. The mean duration for conservative treatment was 4.5 + - 0.9 weeks. Eight patients have severe peritendinous adhesions, and one patient was found to have ganglion within first dorsal compartment which was excised along with the release of tendon sheath. Two patients complain of persistent numbness on first dorsal web space post-operatively, indicating superficial radial nerve injury. Three patients had hypertrophic scar post-operatively (Fig. 6). There was no wound healing complication. Six patients had recurrent symptoms after 1–2 months of complete pain relief. The average preoperative DASH score was 42.26 which was reduced to 5.37 (Fig. 7). The average preoperative VAS score was reduced from 7.30 to 2.33 (Fig. 8).

Discussion

The management of De Quervain’s tenosynovitis is based on severity of condition. Various options for conservative treatment include non-steroidal anti-inflammatory

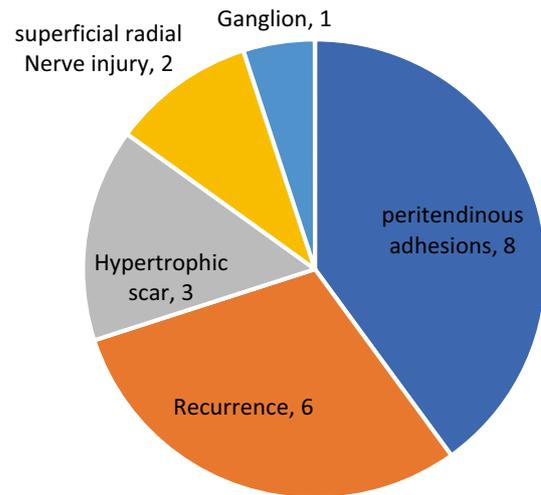


Fig. 6 Intraoperative and post-operative complications

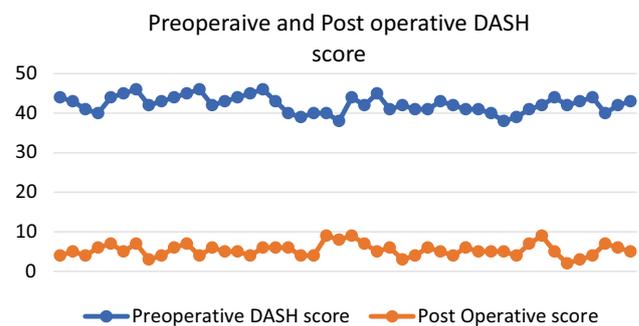


Fig. 7 Preoperative and post-operative DASH score

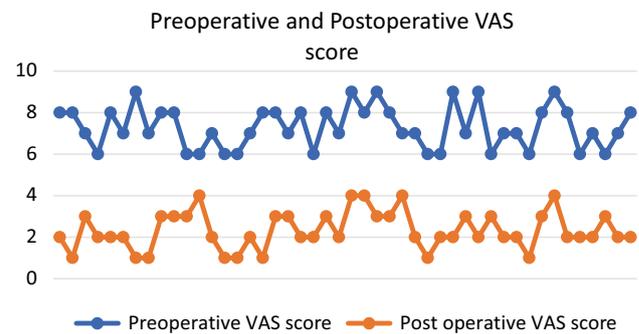


Fig. 8 Preoperative and post-operative VAS score

medicines, thumb spica splint, local corticosteroids injection and occupational therapy. The thumb spica splint that keeps the wrist in neutral, 30° of carpometacarpal (CMC) joint flexion and 30° of thumb abduction with the thumb interphalangeal (IP) joint free, is recommended [10]. The occupational therapy consists of activity modification with

patient education, desensitisation and therapeutic exercises like eccentric loading exercises which have been found to be effective [11, 12]. Recently, non-thermal therapeutic ultrasound with 3 MHz frequency has also been found to be effective for healing effects of tendon injuries and tissue regeneration [13]. In 1972, McKenzie reported 80% success rate ($n = 30$) with the use of local corticosteroid injection in management of De Quervain's tenosynovitis and advised to reserve surgery for refractory cases only [14]. Recently, Cochrane-based meta-analysis has raised question regarding effectiveness of local corticosteroid injection [15]. In various clinical studies, intracompartmental septum has been found in 60–80% cases between APL and EPB tendon which may cause treatment failure with steroid injection [16, 17]. Zingas et al. [18] have found that higher rate of symptom relief was attained in patients with successful steroid injections into the APL and EPB compartments than that with a steroid injection only into the APL or none of the compartments. Takuya Sawaizumi et al. [19] reported 89% efficacy of two-point accurate triamcinolone injection into tendon sheath of APL and EPB tendon than one-point injection at maximum tenderness. Various complications have been reported following steroid injections, including local infection and depigmentation of the skin, atrophy of subcutaneous fat and, less frequently, tendon rupture [20]. In animal studies, Tatari et al. [21] reported increased tendon degeneration after intratendinous injection of steroid and enlargement of the tendon mass and strong adhesion to the subcutaneous tissue due to injection partly outside the tendon. MWN Wong et al. [22] reported predispositions to spontaneous tendon rupture after intratendinous steroid injection due to suppressed activity of human tenocyte and decreased collagen production. Froimson [23] observed that surgery is readily chosen to treat De Quervain's disease with the view of reducing the treatment period and preventing recurrence.

Fritz de Quervain first described surgical release of first dorsal compartment in 1895 with classic transverse incision [1]. Between 1895 and 1955, Finkelstein [7], Lapidus and Fenton [24] reported 92% and 91% of success rate of surgery, respectively. Thereafter, various modifications have been made in surgical technique. The use of longitudinal incision offers several advantages like easy finding of compartment variations, superficial branches of radial nerve and prevention of palmar tendon subluxation as a result of more dorsal release of the compartment sheath [25, 26]. Scheller et al. [27] presented the long-term results of De Quervain's disease surgery from 1988 to 1998 where 94 patients were operated using a longitudinal incision and a partial resection of the extensor ligament which concludes that decompression of both tendons and partial resection of the extensor ligament with a maximum of 3 mm can provide excellent long-term results. A similar study was done by K Kumar who reports improved VAS score with longitudinal incision

in Indian population. He found more hypertrophic scar with transverse incision which results in rubbing of Bengals with scar and poor VAS score as compared to longitudinal incision [28].

Conclusion

Though steroid injection has been preferred as first-line treatment in the treatment of De Quervain's tenosynovitis, its complications should not be underestimated. Surgical release is the gold standard treatment which allows early and complete symptomatic relief with low recurrence.

Compliance with ethical standards

Conflict of interest There is no conflict of interest.

Human and animal rights This article does not contain any studies with animals performed by any of the authors.

Informed consent A well informed consent was taken from all patients participating in the study.

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