Does Radial Styloid Abnormality in de Quervain's Disease Affect the Outcome of Management?

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Abstract Radiological changes have been described in de Quervain's disease of the wrist. The author analyzed the clinical data of 114 patients who reported to the orthopedic clinic of a Regional Referral Hospital for a period of 4 years [2003 to 2007]. Radiographs of the wrist were available for 39 cases, of which 14 [35.89%] were found abnormal. Two patients with abnormal radiographs [14.28%] required surgery where as 7 out of 25 [28%] with normal radiographs were managed surgically. Radial styloid abnormality was not found statistically significant [$p < 0.05$], and the outcome of management was irrespective of the changes in the radial styloid.

Keywords de Quervain's disease · Tenosynovitis · X-ray image · Radial styloid · Hand surgery

Introduction

de Quervain's disease is tenosynovitis of the abductor pollicis longus and extensor pollicis brevis in the first dorsal compartment of the wrist [1, 4]. Increased frictional forces and microtrauma due to household activities in the dominant

hand have been described as causative factors [4]. The disease is characterized by pain centered over the radial styloid which is of gradual onset and tenderness over the first dorsal compartment. Finkelstein test is believed to be diagnostic. Radiological changes in the ulnar styloid have been described by various authors, though there are reports that routine radiographs are not required [1, 3, 4, 7]. Skeletal changes in the distal radius can range from osteopenia to skeletal outgrowth resulting in bony spikes from the styloid process.

Materials and Methods

Details of patients treated in a Regional Referral Hospital with complaints of pain over the radial styloid were retrieved from the Hospital Information Management System for a period of 5 years from 2003 till 2007. All records of patients managed with International Classification of Diseases codes M65.4—radial styloid tenosynovitis [de Quervain] and M 65.9 [synovitis and tenosynovitis, unspecified] were retrospectively analyzed. Patients with history of pain and tenderness and positive Finkelstein test were diagnosed to have de Quervain's disease.

There were a total of 114 cases, of which 5 were males [female 95.6%]. Age of patients ranged from 24 to 66 [mean 38.97]. All cases not responding to analgesics and splinting of the wrist were investigated with Postero Anterior and lateral view X-rays.

Radiographs of the wrist were done in 39 cases. Radiographs of the wrist were rated as abnormal in 14 cases [35.89%] (Figs. 1, 2, 3, 4, and 5; Table 1).

Eight cases were found to have periostitis of the radial styloid resulting in bony spikes or projections. Two cases, in addition to periostitis, showed calcified lesions possibly in the tendon sheath. One case showed sclerosis of the

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Figure 1 Bony scalloping at the radial styloid process with subtle periosteal bony apposition [white arrow]. Flake of calcification in the tendon sheath [white arrow head] and localized osteopenia also seen in the same area.

radial styloid. There was osteopenia of the radial styloid in three cases [21.42%] (Fig. 6).

None of the patients with radiological changes received prior injection of local steroids, whereas two patients who underwent surgery with normal radiographs had prior injection of steroids. Five out of 14 cases had successful outcome with local steroid injection. Only two cases in the series with radial styloid abnormalities were managed by deroofing [release of the first dorsal compartment] of the tendon sheath [14.28%]. Eleven patients with normal radiographs successfully received local steroid injection, whereas seven cases with normal findings in the radiographs underwent deroofing [28%]. There were no anomalies of the tendons in the operated patients. A bony procedure [removal of the bony spur or osteophytes] was not done in the patients (Table 2).

Radial styloid abnormality was not found statistically significant [$p < 0.05$], and the outcome of management was

Figure 3 Scalloping at the radial styloid process with overlying smooth periosteal reaction. Localized osteopenia also seen in the same area [white arrow heads].

irrespective of the changes in the radial styloid. To test the significance of relationship, we used the Chi-Square and the p value tests. In both cases, we found that these two variables are independent.

Discussion

Tenosynovitis of the tendons in the first dorsal compartment of the wrist, commonly known as de Quervain's disease, is diagnosed by the clinical symptoms and by positive Finkelstein test. Radiographs are not usually required for diagnosis.

Finkelstein has reported that radiographs are "uniformly negative" in de Quervain's disease [1, 3, 7]. Radiological abnormality has been described as early as 1952 by Francon et al., where they described a bony spicule over the distal end of the radius [5]. Weston, in a radiological

Figure 2 Localized osteopenia with minimal scalloping seen in the radial styloid process [white arrow head].

Figure 4 Minimal scalloping of the radial styloid process, trabeculated [soap-bubble] periosteal reaction seen over the same area.

Figure 5 Localized osteopenia over the radial styloid process [white arrow head].

study of 47 cases, found no changes in the underlying bone [8].

Many authors have analyzed the skeletal changes in de Quervain's disease. Osteoporosis has been noticed by various authors [5, 7], and local hyperemia due to inflammatory process was considered as the causative factor. Chein et al. retrospectively analyzed the skeletal changes in the radial styloid and found cortical erosions, sclerosis, or periosteal bone apposition which authors suggest could lead to the diagnosis of de Quervain's tenosynovitis [1]. Authors found a positive predictive value if there is abnormality of the radial styloid. Leao's series showed 6 cases with periosteal reaction out of 22 cases in which radiographs were made [5, 7].

Many theories have been proposed as the causative factors for the skeletal abnormalities.

X-rays may show skeletal changes in the radial styloid which could irritate the tendons [4]. Reactive periostitis from the inflammation of the tendon sheath has been proposed as the etiological factor for skeletal changes [1, 6]. Poulsen, in 1911, attributed the condition to chronic irritation in the periosteum due to straining through the tendovaginal compartment, and he named it traction periostitis similar to periostitis in the tibia [2]. Periosteal new bone formation around the posterior aspect of the medial malleolus has been reported in tenosynovitis of the

Table 1 Table showing the total number of patients and their management.

Number of patients	Radiological findings in styloid process	Conservative management	Decompression of first dorsal compartment
25	Normal radiograph	18	7
14	Radial styloid changes present	12	2

Figure 6 Anatomic area showing the area of pain and the skeletal changes.

posterior tibial tendons [6]. There could be inflammation of the peritendinous structures [3].

Abnormalities of radial styloid in de Quervain's disease occur distal to the epiphyseal remnant [1] and should not be confused with spur at the level of epiphyseal remnant.

Conclusions

Radiographs of the wrist are necessary to rule out any other lesion resulting in wrist pain in patients not responding to conservative management of de Quervain's disease. Though considered as a manifestation of de Quervain's disease by some authors [1], styloid abnormalities do not affect the outcome of management as proved in this study.

Table 2 Details of patients with radiological changes in the radial styloid.

Number	Age/sex	Radiologic findings	Management
1	61/F	Periostitis, with bony projections	Surgical
2	39/F	Sclerosis of the radial styloid	Local steroid
3	51/F	Periostitis, with bony projections	Conservative
4	38/F	Osteopenia of the radial styloid	Local steroid
5	58/F	Periostitis, with calcific lesions	Conservative
6	24/F	Periostitis, with bony projections	Local steroid
7	51/F	Periostitis, with bony projections	Surgical
8	42/F	Osteopenia of the radial styloid	Conservative
9	58/F	Periostitis, with bony projections	Local steroid
10	53/F	Periostitis, with bony projections	Conservative
11	52/F	Periostitis, with bony projections	Conservative
12	33/F	Osteopenia of the radial styloid	Local steroid
13	44/F	Periostitis, with calcific lesions	Conservative
14	39/F	Periostitis, with bony projections	Conservative

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Conflict of interest None

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