Dispelling the Myth of Work-Related de Quervain’s Tenosynovitis

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Abstract

Keywords

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De Quervain’s Tenosynovitis (DQT) is a common condition characterized by pain about the dorsal-radial aspect of the wrist, just proximal to the radial styloid. The condition is precipitated by a thickened first dorsal compartment and its tendons. The impression that DQT is caused from work-related injury is misdirected, as no study has established an association between hand usage at work or trauma with DQT. Physicians should exercise caution when discussing the causes and natural history of DQT with symptomatic patients.

Initially described in the late 19th century, de Quervain’s tenosynovitis (DQT) is a common condition that causes pain around the dorsoradial aspect of the wrist, just proximal to the radial styloid.1 The condition is precipitated by a thickened first dorsal compartment and its tendons, the abductor pollicis longus (APL), and the extensor pollicis brevis (EPB).2 These symptoms may be associated with lost work and secondary gain from workmen’s compensation litigation.3 In fact, there are now legal consultants that advertise as “repetitive stress injury attorneys.” Injury lawyer Web sites claim that DQT produces “career-ending disability” and advertise cases in which they won tens of thousands of dollars for perceived work-related cases. However, the belief that DQT is caused by work-related injury is misdirected, as no study has established an association between hand usage at work or trauma with DQT.4,5 This erroneous conviction may be precipitated by a system of workmen’s compensation that pays individuals not to work.

The extensor retinaculum is thickened in DQT but not from an inflammatory or traumatic work related process. Instead, the first dorsal compartment undergoes metaplastic change with thickened, less vascular, synovial layers and may ultimately be three to four times thicker than normal.6 In addition, the first dorsal compartment experiences a decreased cross-sectional area. An analysis of biopsy samples taken from patients with DQT undergoing first dorsal compartment release found that the histopathology of APL and EPB tendon sheaths was characterized by myxoid degeneration with dense fibrous tissue and mucopolysaccharide accumulation.7 The authors postulated that these changes were consistent with an intrinsic degenerative mechanism rather than an inflammatory etiology, thus questioning the nomenclature of tenosynovitis. This narrow, morphologically abnormal first dorsal compartment causes impingement and compression of the APL and EPB. This, in turn, increases the tensile load of the irregular retinaculum, stimulates nociceptors, and causes pain.1,2,8–12

Cadaveric analyses have determined that an additional septum within the first dorsal compartment is present in 34 to 44% of individuals.13,14 Subcompartmentalization has been reported to be as high as 86 to 94% in patients with DQT and is often found bilaterally. Additionally, variable numbers of APL and EPB tendon slips have been observed in cadaveric and control wrists. The authors of a large meta-analysis comparing 1,901 normal cadaver specimens and 470 wrists surgically treated for DQT postulated that the variable tendinous insertions affect the degree of constriction within the compartment.14 This frequently abnormal constrictive anatomy may be
the solitary culprit in precipitating degenerative changes in the
first dorsal compartment tendon sheaths and developing DQT
symptoms.\textsuperscript{15–18}

In another analysis, wrists with DQT underwent a diagnos-
tic ultrasound of the wrist extensor compartments before the
first dorsal compartment release. Subcompartmentalization
was present in 73\% of the first dorsal compartments. The study
demonstrated that the vast majority of patients undergoing
DQT release have predisposing compressive anatomy and that
ultrasound was 100\% sensitive in the diagnosis of subcom-
partmentalization.\textsuperscript{19} An absence of subcompartmentalization
on ultrasound may be a useful adjunct to exclude patients from
a diagnosis of DQT and operative management if there is
clinical suspicion for secondary gain.

In addition to anatomical factors, patient factors may also
be associated with DQT. Those with DQT have high rates of
both anxiety and depression,\textsuperscript{20} are more likely to be part-
time workers,\textsuperscript{4} and there may be a genetic predisposition.\textsuperscript{21}
Stenosing tenosynovitis of the flexor tendons is found
more often in patients with DQT.\textsuperscript{4} DQT is 10 times more
common in females than males,\textsuperscript{2,5,22} and is often noted in the postpar-
tum period.\textsuperscript{23,24} Finally, patients who undergo surgical treat-
ment for DQT are more likely to have Medicaid insurance,
psychiatric illness, and a disabled work status.\textsuperscript{25}

While there are many nonmodifiable factors that contrib-
tute to DQT, modifiable (work-related) factors have not been
identified as risk factors in large series. One case–control
analysis compared 189 patients with DQT and 198 control
patients without DQT.\textsuperscript{5} While DQT patients were more likely to
be older (52 vs. 43 years) and female (76 vs. 33\%), there was no
difference in the groups with regard to the rate of manual labor
profession (18 vs. 26\%), medical comorbidities, wrist trauma,
computer work, or repetitive forceful work. In fact, patients in
the DQT cohort worked 4 hours less than those in the control
cohort per week (34 vs. 38 hours) and were less likely to
complain of morning wrist stiffness. The authors concluded
that neither heavy manual labor nor trauma could be con-
sidered a cause of DQT. Furthermore, a systematic review and
meta-analysis including 80 articles comprising automecha-
nics, garment workers, shoe assemblers, and meat packers
determined that there was no causal relationship between
occupational risk factors and DQT.\textsuperscript{4} Furthermore, a prospec-
tive analysis of 598 French industrial workers employed in
repetitive labor completed a self-administered questionnaire
and underwent a physical examination at one point and again
3 years later. While psychosocial factors and personal factors
contributed to wrist tendinitis, the nature of the physical work
was not identified as a risk factor.\textsuperscript{22}

In Finkelstein’s original 24 patient survey from 1930, only
one patient was a factory worker. Upon surgical exploration,
this individual had subsheaths within his first dorsal compart-
ment.\textsuperscript{10} It is possible that work-related activity may cause
discomfort to the patient with DQT already or one who has the
nonmodifiable risk factors that may predispose DQT. However,
it is far less likely that work-related activity itself is the primary
cause of DQT.\textsuperscript{20} Just as riding an exercise bike does not cause
stenosis of the coronary arteries and its associated symptoms,
repetitive work or trauma does not cause DQT.\textsuperscript{26} Physicians
should exercise caution when discussing the causes and
natural history of DQT with symptomatic patients.

Note

The views expressed in this publication are those of the
authors and do not reflect the official policy or position of
the Department of the Army, Defense Health Agency, or
the US Government.

Conflict of Interest

None declared.

References

1. de Quervain F. Über das Wesen und die Behandlung der steno-
sierenden Tendovaginitis am Processus styloideus radii. Münch
2. Moore JS. De Quervain’s tenosynovitis. Stenosing tenosynovitis of
the first dorsal compartment. J Occup Environ Med 1997;39(10):
990–1002.
4. Stahl S, Vida D, Meisner C, et al. Systematic review and meta-
analysis on the work-related cause of de Quervain tenosynovitis:
A critical appraisal of its recognition as an occupational disease.
5. Stahl S, Vida D, Meisner C, Stahl AS, Schaller HE, Held M. Work-
related etiology of de Quervain’s tenosynovitis: a case-control
study with prospectively collected data. BMC Musculoskelet
Disord 2015;16:126.
6. Ilyas AM, Ast M, Schaffer AA, Thoder J. De Quervain tenosynovitis
7. Clarke MT, Lyall HA, Grant JW, Matthews MW. The histo-
pathology of de Quervain’s disease. J Hand Surg Br 1998;23
8. Flörcken H. Zur Frage der stenosierenden Tendovaginitis am
Processus styloideus radii (deQuervain). München Med
Wochenschr 1912;59:1378.
9. Patterson DC. DeQuervain’s disease: stenosing tenosynovititis at
10. Finkelstein H. Stenosing tenosynovitis at the radial styloid
12. Younghusband OZ, Black JD. DeQuervain’s disease: stenosing teno-
synovitis at the radial styloid process. Can Med Assoc J 1963;
89:508–512.
13. Leslie BM, Ericson WB Jr, Morehead JR. Incidence of a septum
within the first dorsal compartment of the wrist. J Hand Surg Am
14. Lee ZH, Stranix JT, Anczai L, Sharma S. Surgical anatomy of the first
dorsal extensor compartment: a systematic review and comparison
of normal cadavers vs. De Quervain syndrome patients. J Plast
Quervain’s tendovaginitis stenosans in Jordanians. Jordan Med J
dorsal extensor compartment: an anatomic study. J Hand Surg Am
17. Minamikawa Y, Peimer CA, Cox WL, Sherwin FS. De Quervain’s
syndrome: surgical and anatomical studies of the fibroosseous
18. Shiraishi N, Matsumura G. Anatomical variations of the exten-
sor pollicis brevis tendon and abductor pollicis longus tendon–


