Colonoscopist’s thumb: DeQuervain’s syndrome (tenosynovitis of the left thumb) associated with overuse during endoscopy

Mitchell S. Cappell, MD, PhD, FACP
Philadelphia, Pennsylvania, USA

Individuals who perform repetitive stereotyped motion at work are at high risk for development of chronic occupational injury from mechanical stress to specific joints or tendons,1 such as tennis elbow in athletes2 and carpal tunnel syndrome in musicians.3 In particular, DeQuervain’s syndrome (tenosynovitis of the thumb tendon) is strongly associated with occupational risk factors.4,5

The colonoscopist uses the left thumb to turn both control dials (wheels) on the colonoscopic head for horizontal or vertical colonoscopic tip deflection for steering during colonoscopy without powered assistance. This thumb provides all the mechanical force to turn the colonoscopic tip against colonic resistance and repeatedly exerts this force to negotiate colonic turns. This frequent, repetitive, and chronic occupational thumb motion and force could injure the thumb tendon. A novel case is reported of a gastroenterologist with DeQuervain’s syndrome, with pain exacerbation during every left thumb flexion during colonoscopy. The patient had for several weeks used a nonprescription wrist brace (for an erroneous self-diagnosis of carpal tunnel syndrome) without pain relief until a neurologist excluded this diagnosis.

The gastroenterologist had experienced moderate left thumb pain while learning to perform colonoscopy during his fellowship 20 years earlier, but the pain had disappeared after several months without recurrence until the prior 10 weeks. The patient was otherwise well, with no history of arthritis, other arthralgias, inflammatory disease, or left hand trauma. The patient had no hobbies or avocations that caused overuse of the left thumb. The patient was taking 10 mg of atorvastatin (Lipitor) daily for hypercholesterolemia.

Physical examination revealed a healthy man with no rash or arthritis. There was severe point tenderness and moderate swelling over the distal portion of the radial styloid just proximal to the anatomic snuffbox on the left hand. Isometric resistance to left thumb extension and abduction elicited severe pain at this site. Ulnar rotation of the wrist, with the thumb flexed and the other fingers flexed over the thumb, elicited severe pain at this site.

METHODS

This study was approved by the institutional review board at Albert Einstein Medical Center. The patient provided written consent to report this case.
(Finkelstein's sign). Roentgeograms of the left hand, wrist, and thumb revealed no fractures or calcifications. The patient was diagnosed with DeQuervain's syndrome. The pain improved only slightly during the ensuing 5 weeks with wearing of a thumb splint and oral administration of ibuprofen 400 mg 4 times daily. The orthopedist then injected corticosteroids into the synovium; there was rapid resolution of the pain and swelling. The gastroenterologist was then able to perform about 20 endoscopies per week wearing a thumb splint exclusively during colonoscopy, with no recurrence of thumb pain or swelling and no evident impairment in colonoscopic performance.

**DISCUSSION**

The initial colonoscopes were ergonomically sound in that manual steering was controlled by the colonoscopist's right hand, with use of a cylindrical, or similar, dial, but required 2 colonoscopists: one to hold the colonoscopic head with the left hand and control the cylindrical dials with the right hand and a second colonoscopist to hold and advance the colonoscopic shaft with either hand during colonoscopy. To eliminate the second colonoscopist, the cylindrical control dials were replaced by a pair of wheels (Fig. 1). One colonoscopist could then grasp the colonoscopic head with the left palm, control both dials with the left thumb, and hold the colonoscopic shaft with the now free right hand. This design change required that the left thumb accomplish all colonoscopic tip deflections previously performed by the entire right hand. This resulted in thumb stress from (1) the simple force required to turn one control dial for purely horizontal or vertical colonoscopic tip deflection, (2) the compound vector force required to simultaneously turn both dials for diagonal colonoscopic tip deflection, and (3) exertion of this force in an awkward position with the thumb maximally flexed to reach the outer horizontal control dial and the wrist rotated to apply torque to the instrument shaft (Fig. 1B).

A direct relationship between the orthopedic injury and the occupational stress is supported by the currently reported absolute correlation between thumb flexion during colonoscopy and pain exacerbation, the absence of other evident patient risk factors (typing or writing are not syndromic risk factors), the exclusively unilateral pain in the exposed thumb, and the biologically plausible mechanism of injury from overuse during colonoscopy. A preliminary, nonrandomized survey found that 3 of 10 gastroenterologists had left, but not right, thumb pain associated with colonoscopy (all 3 performed > 1000 endoscopies/year for > 10 years, none of them medically proven to have DeQuervain’s syndrome (preliminary unpublished data, Cappell). A previous pioneering mailed survey of occupational injuries in about 300 gastroenterologists reported that 19% had thumb pain that was frequently exacerbated by endoscopy, that was attributed to endoscopy by the endoscopist, that was more common in endoscopists who frequently performed endoscopy, and that was significantly more common in the left than the right thumb. The anatomic basis of this thumb pain was not, however, analyzed.
The proposed novel occupational syndrome may have significant consequences. When it is advanced, this syndrome may require surgery\textsuperscript{11} and may terminate a colonoscopist’s professional career. In the prior survey, 2% of endoscopists eliminated endoscopy from their practice and another 8% reduced their procedural volume as a result of procedure-related pain.\textsuperscript{10} Other overuse syndromes among endoscopists may cause wrist, elbow, or back injuries. A multifaceted strategy to reduce left thumb strain and help prevent DeQuervain’s syndrome among colonoscopists may include modified colonoscopic technique (e.g., occasional use of the right hand to turn the horizontal control dial to reduce left thumb strain), modified instrument settings (e.g., establish a maximal dial stiffness to reduce left thumb strain), reevaluation of colonoscopic ergonomics (e.g., different colonoscope head and dial sizes [such as the design of gloves] to fit different hand and thumb sizes, or power steering, as in an automobile,\textsuperscript{12} with a strain gauge to prevent excessive colonic force), and research and education (e.g., the American Society for Gastrointestinal Endoscopy Web site survey of repetitive injuries among endoscopists). With the current shortage of colonoscopists,\textsuperscript{6,7} preservation of the left thumb for long-term use is important for public health.

**DISCLOSURE**

The author has no financial interest in the publication of this article.

**REFERENCES**


Current affiliations: Division of Gastroenterology, Department of Medicine, Albert Einstein Medical Center, Philadelphia, Pennsylvania. M. S. C. is a member of the National Archives (History) Committee of the American College of Gastroenterology.

Reprint requests: Mitchell S. Cappell, MD, PhD, Division of Gastroenterology, Department of Medicine, Klein 363, Albert Einstein Medical Center, 5401 Old York Rd, Philadelphia, PA 19141.

Copyright © 2006 by the American Society for Gastrointestinal Endoscopy 0016-5107/$32.00 doi:10.1016/j.gie.2006.04.014