



EDITORIAL



Biceps tenotomy vs. tenodesis

We begin this issue with 2 unusual articles for *JSES*—systematic reviews and meta-analyses on the same topic.^{1,3} Further, both of these are Level I systematic reviews, meaning that they looked only at Level I studies on this topic, which was a comparison of outcomes of biceps tenotomy vs. biceps tenodesis. In addition, we follow these reviews with an original article on the Popeye deformity in proximal biceps surgery and how much of a problem that was for the patients.

Level I studies in orthopedic surgery are somewhat rare, as they are in any surgical specialty, because it is difficult to do blinded studies of invasive procedures, and to obtain enough patients willing to be submitted to a randomized study of those invasive procedures. Systematic reviews of Level I studies are even rarer in the surgical specialties because it is difficult to find enough Level I studies on the same topic to actually do such a systematic review.

The 2 review articles were done by Eric McCarty's group at the University of Colorado¹ and Moin Khan's group at McMaster University in Hamilton, Ontario.³ Both came to essentially the same conclusions—that there were no significant differences in outcomes between proximal biceps tenotomy and proximal biceps tenodesis. Both also showed that a Popeye deformity was more common after biceps tenotomy, as expected, occurring about 7% of the time after tenodesis and about 23% of the time after tenotomy. However, the presence or absence of this deformity did not affect the overall patient outcomes. The numbers are very similar as they studied the same group of Level I studies.

Finally, the third article, on the Popeye deformity, came from a Dutch group led by Derek van Deursen in Amsterdam and Utrecht.² They showed that the Popeye deformity, in many cases, was more of a problem noted by the doctor than by the patient. Only 2 of 97 patients felt that they had a cosmetic deformity, although the doctors found that 32 cases had the Popeye deformity, 19 after tenotomy and 13 after tenodesis, and the 2 groups only agreed on 1 case.

So, in a sense, you could say that these articles, especially the systematic reviews, make this somewhat settled

science. Level I systematic reviews and meta-analyses are the highest-level evidence we can muster, and both found the same thing, mainly that there were no differences in overall outcomes from the 2 procedures. Further, although both reviews found that the Popeye deformity was more common after a tenotomy, it still occurs in tenodesis cases, and the Dutch study showed that this may be more noticeable to the doctors than to the patients, who in many cases did not care about the cosmetic problem.

Unfortunately, we know that this is not always the case, and it is too simplistic to just state that it does not matter which procedure one performs. In my surgical career, I had 2 patients unhappy with the appearance of their arm after a tenotomy. One had me revise that to a tenodesis, and the other scheduled to do so but did not show up—probably going elsewhere. I also had 2 patients with continued pain after a tenodesis, who eventually came to a revision tenotomy that relieved their pain.

On one of the patients unhappy with the tenotomy, he was a young guy with a fairly muscular build, and in retrospect, it was probably the wrong decision not to do a tenodesis. On one of the patients with continued pain after tenodesis, who was in his mid-60s, an initial tenotomy probably would have served him better. As is often the case with medicine and surgery, listen to the patient—they will often tell you the diagnosis, or the surgery needed.

So despite these 3 excellent studies, it behooves all of us to continue to listen to the patients and treat each of them individually, taking into account their age, their builds, their activity levels, their chief complaints, and what they hope to get out of any surgery on their proximal biceps. There are certainly cases where tenodesis will be the proper procedure, where the patient may be more cognizant of the cosmetic appearance of the arm. And in many patients, often older, who may have lesser demands on their arms, and less concern about cosmesis, tenotomy will likely be a sufficient procedure to achieve the patient's goals.

At any rate, the patients should always be informed of the best evidence as to the expected outcomes of either procedure, which are likely very similar, and to the possibility of a cosmetic deformity, which is more common after

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tenotomy, but by no means occurring in all such cases, and in many cases, not a problem to the patient.

Thus, we would like to say that this is settled science, but it is never that easy in medicine or surgery. We applaud all 3 groups for these excellent studies, which we know will help our readers make more informed decisions in treating patients with proximal biceps pathology.

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