

Evidence-Based Medicine in Hand Surgery Clinical Applications and Future Direction



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KEYWORDS

• Evidence-based medicine • Hand surgery • Upper extremity surgery

KEY POINTS

- Level 1 evidence has unified patient care strategies for many common hand and upper extremity problems.
- There are pathologies for which our current evidence base has not yet unified the “best” treatment, and in some cases the management remains controversial.
- For rare, heterogeneous, and atypical clinical presentations, data from level 4 studies are often more helpful in guiding treatment.

AREAS OF HAND AND UPPER EXTREMITY SURGERY WHERE EBM SHOULD UNIFY TREATMENT STRATEGIES

The Treatment of Lateral Epicondylitis

Corticosteroid injections are ubiquitously used in the management of lateral epicondylitis. They are relatively easy to administer by physicians, often requested by patients, and their safety profile is well established. However, their broad use in treating lateral epicondylitis is not data driven, especially given the noninflammatory pathogenesis of the disease. Multiple prospective randomized controlled studies have evaluated corticosteroid injections in comparison with placebo,^{1–3} observation,⁴ physical therapy,⁵ or their combinations.^{6,7} The results demonstrate that corticosteroids are generally effective in the short term (~6 weeks), but no long-term benefit (>1–2 years) is found, particularly with regard to pain, grip strength, and Disabilities of Arm, Shoulder, and Hand (DASH) score. Meta-analyses also have failed to demonstrate a favorable long-term advantage of using corticosteroid injections for lateral

epicondylitis.^{8–10} In addition, studies comparing different corticosteroid formulations^{8,11} (eg, triamcinolone vs methylprednisolone vs betamethasone, vs dexamethasone vs hydrocortisone), number^{12,13} and frequency^{8,14} of injections, or site of injection/injection technique^{7,8,15,16} have also not proven any long-term benefit over placebo or watchful waiting. With respect to evaluating corticosteroid versus plasma-rich protein (PRP) injections, 3 recent level 1 studies have found differing results.^{17–19} The results from Krogh and colleagues¹⁷ favored PRP at 1 month but were no different at 3 months. In contrast, at the 1-year and 2-year follow-up, Peerbooms and colleagues¹⁹ and Gosens and colleagues¹⁸ demonstrated that patients treated with PRP had significantly better DASH and Visual Analog Scale (VAS) scores. However, all patients in these 2 studies significantly improved over baseline, and neither study included a placebo or observation-only group, so it is difficult to draw definitive conclusions about the efficacy of PRP for lateral epicondylitis.

Other studies examining the utility of newer treatment modalities for lateral epicondylitis have

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been reported, including prolotherapy,²⁰ autologous blood injections,^{21,22} acupuncture,²³ extracorporeal shock wave therapy,²⁴ and Botox injections.¹⁵ Although there is interest and innovation in these “newer” treatments, none of these modalities have demonstrated any statistically significant long-term favorable outcome. Additional research is ongoing to examine if any will emerge better than the natural self-limited course of the disease.

EBM bottom line recommendation

No routine corticosteroid injections for lateral epicondylitis.

The Use of Antibiotics During Elective Hand Surgery

Although antibiotics are broadly used in hand and upper-extremity surgery requiring deep dissection, bone reconstruction, and the use of implants, their utility in elective hand surgery is much less established, particularly for those operations lasting less than 2 hours. The emergence of drug-resistant bacteria and other antibiotic-related complications is forcing the surgical community to reevaluate the prolific use of intraoperative antibiotics. Now there is strong evidence against the routine use of prophylactic antibiotics during elective hand surgery. Most of these studies have centered on carpal tunnel release (CTR) surgery. Hanssen and colleagues²⁵ large retrospective review of 3620 carpal tunnel release surgeries reported an infection rate of 0.47%, which is consistent with previous reports in the literature. Although they did not formally evaluate the effect of prophylactic antibiotics on surgical site infection, 80% of their patients received no intraoperative antibiotics. Moreover, Harness and colleagues²⁶ performed a multicenter retrospective review examining the correlation between antibiotic use and the development of a postoperative surgical site infection in 3003 patients. They found no statistical difference in infection rates between patients who received prophylactic antibiotics and those who did not, including a subanalysis of diabetic and nondiabetic cohorts. Kleinert and colleagues²⁷ also found no evidence that the use of prophylactic antibiotics in carpal tunnel surgery was predictive of infection.

Data have also emerged for soft tissue hand surgery cases other than carpal tunnel release. In their retrospective review of 600 patients, Tosti and colleagues²⁸ studied infection rates in patients undergoing trigger finger release, soft tissue mass excision, and first dorsal compartment release, in addition to CTR. Their patients manifested only superficial infections and the overall infection rate

was 0.66%. Patients who received antibiotics had an infection rate of 0.47%, whereas the infection rate in those who received no antibiotics was 0.77%. These rates were not statistically significant. In a prospective randomized study of 1340 patients, Aydin and colleagues²⁹ divided patients into 4 groups based on the depth and type of surgery. Group 1 included surgery limited to the skin and subcutaneous tissue, whereas group 2 involved surgery to tendons, nerves, and arteries. Group 3 included surgeries involving bone and joints, and group 4 included patients who had skin-loss defects. Half of the patients in each group received prophylactic antibiotics, and the researchers compared infection rates between those patients who received intraoperative antibiotics and those who received no antibiotics. They found no statistical differences in infection rates between antibiotic use versus placebo in any of the 4 groups. In another large retrospective review of 8850 outpatient hand surgery cases, Bykowski and colleagues³⁰ examine the rate of surgical site infection with the use of antibiotics. Infection rates were not statistically different between those patients who received antibiotics and those who received none. In addition, their subgroup analysis of those patients who were more high risk for infection (those with diabetes and those who smoke) also failed to demonstrate that antibiotics reduce surgical site infections.

These studies demonstrate that the routine use of prophylactic antibiotics in elective soft tissue hand surgery less than 2 hours long is not warranted. Despite this evidence, some hospital systems continue to mandate the continued routine use of prophylactic antibiotics. Future directions should include work in this area by researchers and administrators alike to create guidelines that promote evidence-based, safe, and effective antibiotic use in upper extremity surgery.

EBM bottom line recommendation

No routine prophylactic antibiotics for elective soft tissue hand surgery cases lasting less than 2 hours.

The Repair of Zone II Flexor Tendon Injuries

There is no shortage of literature describing repair of zone II flexor tendon injuries with regard to technique and suture type and configuration. There is strong consensus that surgical repair is not warranted for incomplete tendon injuries involving less than 60% of the cross-sectional area, especially if finger range of motion is not impeded. However, tendon disruptions greater than 60% should be repaired. The ideal repair should be strong enough to withstand early active hand

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