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Original Research

Report on the Evidence-Based Practice Committee's Survey on Dupuytren Disease



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Purpose: The Evidence-Based Practice Committee of the American Society for Surgery of the Hand (ASSH) set out to assess the membership's practice patterns (PPs) and knowledge of evidence-based principles for Dupuytren disease (DD).

Methods: A 21-item multiple-choice survey was distributed to all ASSH members via email in June 2020. Questions were divided into 2 types: evidence-based practice (EBP) and PPs. The survey addressed the following subtopics: nonsurgical, percutaneous, and open surgical management of DD.

Results: The response rate was 18% (n = 419). Of 13 EBP questions, 5 were answered with the preferred response by >75% of surgeons. The remaining 8 EBP questions had greater frequencies of less preferred responses, which concerned the current evidence for percutaneous management, as well as nonsurgical and postoperative management of DD. Of the PP questions, there were differences in opinion on how to manage a painful nodule, the percutaneous technique (eg, collagenase injection vs percutaneous needle aponeurotomy), and the choice of surgical incision for open fasciectomy (eg, Bruner incision with Z-plasties, partial closure with an open transverse palmar component, or longitudinal incision with Z-plasties).

Conclusions: Hand surgeons continue to be well informed about current evidence-based practices for treating DD and can improve their knowledge by familiarizing themselves with current data on percutaneous and nonsurgical methods. There exist differences in PPs for DD in the ASSH membership, specifically with less invasive management; and knowledge of peer practices can help navigate differences, critically interpret the evidence, and optimize patient care.

Type of study/level of evidence: Economic/Decision Analyses V.

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The Evidence-Based Practice Committee of the American Society for Surgery of the Hand (ASSH) conducted a survey in June 2020 to assess knowledge of the members on evidence-based principles concerning Dupuytren disease (DD) and to assess practice pattern trends among the members of the ASSH. The purpose of the survey

and this report is to serve as an educational tool for ASSH members on evidence-based management and to summarize pertinent existing evidence in the literature for common diseases of the hand.

The committee's rationale for selecting DD as the topic of the first survey is 2-fold—it is commonly encountered by hand surgeons, and there is abundant literature to guide clinical decision making. Additionally, ASSH members from both orthopedic and hand surgery backgrounds typically manage DD.

The questions and answers are published in this report, as well as detailed explanations for selected topics. The reference list is available as well for surgeons seeking further reading on the

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current evidence. An analysis of practice pattern questions will also raise awareness of how our colleagues manage DD in their daily practices.

Methods

A 21-question survey constructed on SurveyMonkey was sent out to active and international active members of the ASSH via an email. A single reminder email was sent 1 week afterward.

Twenty questions were divided into 2 types: evidence-based practice (EBP) and practice patterns (PP). The EBP questions had preferred answers rooted in scientific data, with the goal of identifying areas in which the ASSH membership did or did not have a sound knowledge of the evidence. Although there is a wide variability in the amount and quality of data for any given question as it relates to DD, we attempted to select questions where we thought there was sufficient supporting data to render a correct answer. We present our referenced studies for the EBP questions later in the manuscript so that the readers can personally review the sources if they choose. The PP questions presented clinical scenarios where controversy may exist regarding the ideal management. One demographic question at the start of the survey asked respondents for their practice location data in the form of city, state, and country. The EBP and PP questions evenly addressed the following sub-topics: nonsurgical, percutaneous, and open surgical management of DD.

Survey data were aggregated and analyzed by the authors and stratified by percentage correct for EBP questions. Meanwhile, for PP questions, the authors identified areas where there was uniform member agreement, as well as where the members were sharply divided.

Results and Discussion

The survey was sent to 2,271 members, and 419 responses were recorded (response rate = 18%). The complete survey, including all answer choices, can be found in the [Appendix E1](#) (available on the *Journal's* website at www.jhsgo.org).

Evidence-based practice questions

Table 1 summarizes the EBP questions, the preferred answer, and the proportion of respondents who chose the preferred answer.

Of the 13 EBP questions, >75% of the respondents answered correctly for 5 of the questions, suggesting an outstanding universal knowledge for those topics. Another 6 questions had a correct response rate between 50% and 75%, and 2 questions had a correct response rate of <50%. Rather than highlight the evidence in areas the membership knew well, we will highlight the evidence-based data supporting the correct responses for the questions that <75% of respondents answered correctly, starting with the least correctly answered.

Question #2 (noninvasive options for treating recurrent contracture)

The focus here was on available noninvasive options for recurrent contractures when collagenase injection (CI) was not an option. This is a relatively uncommon scenario, with limited available literature focusing on this specific question. However, a recent randomized controlled trial (RCT) of 30 patients with primary and postoperative recurrent Dupuytren contracture found that 20 hours a day of orthosis fabrication for 3 months, whether with a tension orthosis or compression orthosis, resulted in anywhere from 5° to 35° contracture improvement, along with improvement

in total active extension.¹ They found no significant difference between the types of orthoses used, although perhaps data were underpowered for this analysis; however, some patients with tension orthoses developed skin ulcers. Also, it is important to note that long-term results are not reported, and the practical issue of compliance with these orthosis fabrication requirements may have influenced the response to this question. Most of our survey respondents (83%) answered that none of the nonsurgical treatments improve recurrent contractures; nevertheless, this recent trial provides some indication that a therapy regimen may improve contractures, at least in the short term.

Question #13 (best options among hand therapy and static/dynamic orthosis fabrication after open fasciectomy when considering outcome and cost)

Approximately 70% of the respondents believed that post-operative orthosis fabrication (56% static, 14% dynamic) in conjunction with hand therapy after limited fasciectomy provided the best balance of outcome and cost. While 22% believed neither orthosis fabrication nor hand therapy had support, only 8% of the respondents correctly favored hand therapy only. Larson and Jerosch-Herold² performed a systematic review on the clinical effectiveness of orthosis fabrication after surgical release of Dupuytren contracture. However, their data lacked statistical significance supporting static or dynamic orthosis fabrication and were limited by study designs. Subsequently, they performed a multicenter RCT to compare outcomes between surgically-treated patients with DD who had therapy with orthosis fabrication versus therapy alone, with orthosis fabrication if needed for recurrent contracture.³ No differences were observed in self-reported disability or active range of motion. Kemler et al⁴ conducted a RCT between hand therapy or orthosis fabrication and hand therapy for patients treated for a proximal interphalangeal (PIP) contracture of at least 30° and found no statistically significant difference in the outcome at 1 year. Given the expense of therapists' time, orthosis materials, and the inconvenience of orthosis wear, they did not recommend postoperative orthosis fabrication with hand therapy.

Question #8 (percutaneous needle aponeurotomy versus collagenase injection for recurrence rates)

While 53% of the respondents were aware that there are no differences in the recurrence rate after CI versus percutaneous needle aponeurotomy (PNA), those who believed that there was a difference tended to believe that the recurrence rate was lower (25%) rather than higher (16%) with collagenase. In randomized trials, the superiority of CI over PNA has not been proven. A recent study with 1 year of follow-up, with 69 patients in the CI group and 71 patients in the PNA group, demonstrated nearly identical recurrence rate of metacarpophalangeal (MCP) joint contracture (1.7% vs 1.6%).⁵ A randomized trial of 50 patients showed 83% recurrence after CI and 68% after PNA ($P = .25$) for proximal interphalangeal joint contracture at the 2-year follow-up.⁶ A randomized trial with 5 years of follow-up found that the recurrence rate from PNA was 85% ($P < .05$), but older age at the time of treatment decreased the recurrence to 60% to 80% after the age of 65.⁷ More recently, a study included 152 patients followed to 2 years, and recurrence risk was no different: 76% after CI and 79% after PNA ($P = .697$) for MCP joint contracture.⁸

Question #7 (PNA versus CI for minor or major complications)

While 59% of the respondents knew that CI carries an increased risk of minor complications than PNA, 16% thought that there was no difference. Another 24% believed there was a difference in major complications, with 12% believing that CI was superior and 12% believing that PNA was superior. A recent meta-analysis involving

Table 1
Evidence-Based Practice Questions: Summary of Results

#	EBP Questions – Topic Addressed	Preferred Answer	% Responding with Preferred Answer
1	Corticosteroid injection in treating DD	Improvement in painful symptoms and softening of the nodules	82
2	Noninvasive options for treating recurrent contracture	Compressive or tension orthosis fabrication for 20 hours a day over the next 3 months	6
3	Supervised therapy and orthosis fabrication for initial treatment	Orthosis fabrication and soft tissue mobilization	62
4	Key predictors of an aggressive disease course	Bilateral disease	68
5	PNA vs CI for range of motion outcomes	No clinically significant difference	70
6	Most likely location for recurrence of contracture after CI	Proximal interphalangeal joint	92
7	PNA vs CI for minor or major complications	Increased risk of minor complications with CI	59
8	PNA vs CI for recurrence rates	No difference	53
9	Common degrees of improvement after PNA	Improvement of 40° at the MCP joint and 20° at the PIP joint	61
10	Best open surgical option for improvement in motion with a 70° PIP contracture	Limited fasciectomy	93
11	Best incision to decrease recurrence rate after open limited fasciectomy with a 70° MCP contracture	Z-plasty of a longitudinal incision	87
12	Best option to improve ongoing contracture despite open limited fasciectomy for severe PIP disease	Capsulotomy with capsuloligamentous release	76
13	Best options among hand therapy and static/dynamic orthosis fabrication after open fasciectomy when considering outcome and cost	Hand therapy alone	8

10 articles (425 patients treated with CI and 418 treated with PNA) found increased odds of adverse effects after CI than after PNA. However, the effect was lost when only major complications were assessed.⁹ A prospective RCT of 70 patients reported digital nerve damage after PNA in 6%, as evidenced by persistent numbness and hyperalgesia 3 years after the procedure.¹⁰ While none of the CI patients in this trial had this complication, the overall complication rate was 100% after CI versus 18% after PNA. A smaller study of 59 patients found similar outcomes and only minor complications of skin tears, ecchymosis, and edema.¹¹ Another study of a prospective cohort of 54 patients documented high risk minor complications of edema and bruising (87% and 85%, respectively) after CI.¹² It should be noted that some of the minor complications that are reported, such as edema and ecchymosis, may be considered by some to be a natural consequence of the procedure, and this should be taken into account when evaluating this evidence.

Question #9 (common degrees of improvement after PNA)

In total, the respondents were quite accurate in their responses to this question. Although only 61% were aware that after PNA improvements averaged 40° at the MCP joint and 20° at the PIP joint, another 25% believed that the average MCP improvement was instead 60°. Thus, 86% of the respondents were quite accurate. The data supporting these average improvements have shown consistently that the greatest degree of correction is seen in MCP joint contractures. Stromberg et al⁸ in their prospective clinical trial showed that the improvement of MCP joint extension from baseline to 2 years after surgery was 40° and that of the PIP joint was 10°. A large retrospective study by Molenkamp et al¹³ involving 470 metacarpal rays showed that the overall average correction of contracture was from 37° to 2°. The same study found that at 8 weeks after surgery, the MCP joint extension improved by 35°, whereas the PIP improved by 30°. Generally, PNA results are excellent across the literature, even when performed secondarily. The study by Molenkamp et al¹³ additionally found that the total passive extension deficit correction was 46° for a primary PNA and 36° for a secondary PNA; however, improvements of 60° have not been reported.

Question #3 (supervised therapy and orthosis fabrication for initial treatment)

While 62% of the respondents selected the preferred response of orthosis fabrication and soft tissue mobilization as the most likely intervention without surgery or percutaneous treatment to improve a PIP contracture, another 31% chose radiation therapy as the most effective. The data in support of orthosis fabrication and soft tissue mobilization are from trials that show improvements in the contractures. However, most of the data reported around radiation therapy for DD indicate mixed effectiveness in the prevention of progression and/or symptomatic relief for painful or prominent nodules and cords, and only minimal if any actual improvement in contractures. In the studies that report radiation has supported improvements in PIP contracture, the radiation has been as an adjunct to other treatments or procedures and not a standalone therapy.^{14–17}

Question #4 (key predictors of an aggressive disease course)

While 68% of the respondents knew that bilateral disease is a predictor of more severe disease progression, another 24% answered that a history of alcohol misuse was the most predictive factor. The association between a history of alcohol misuse and DD has been reported and discussed for decades. However, in a recent large series¹⁸ evaluating various reported associations related to DD, alcohol was found to have less of a connection than previously thought. Moreover, the connection between alcohol misuse and bilateral or more advanced disease is even less clear—if there is a connection at all. However, 1 large series and other smaller epidemiologic studies report that women with a strong family history, patients with bilateral disease, and those with Ledderhose disease have the highest rates of aggressive and/or recurrent disease.^{18–22}

Question #5 (PNA versus CI for range of motion outcomes)

While 70% of the respondents knew that PNA and CI have no differences in outcomes with regard to improvement in the range of motion, the vast majority of other respondents (28%) believed that CI has superior outcomes. It is unclear why those who believed

Table 2
Practice Patterns Questions: Summary of Results

Practice Patterns Question	Most Common Choice
For patients presenting to you with early/mild Dupuytren contracture (painless central cords with minimal MCP contracture and no PIP involvement and a negative tabletop test), what treatment(s) do you offer?	None
For patients presenting to you with uncomfortable palmar nodules associated with DD and no other cords/contracture, what treatment(s) do you offer?	Corticosteroid injection
For a single palpable Dupuytren cord in the palm causing 40° of MCP joint contracture, your primary initial method of treatment is	CI and manipulation
Your postoperative mobilization protocol after PNA for Dupuytren contracture involves	Nighttime orthosis fabrication only
Your postoperative mobilization protocol after injectable collagenase for Dupuytren contracture involves	Nighttime orthosis fabrication only
A 57-year-old right-handed man presents with a central cord in the palm and a contracture at his MCP joint of 60° as well as a more complex cord between the MCP and PIP creases and a contracture of 80° of his PIP of his right ring finger. Assuming you elect to proceed with an open fasciectomy, what incision planning describes the techniques you are most likely to employ?	A Bruner incision into the digit with or without Z-plasties for full wound closure
A 55-year-old right-handed man presents with a well-defined central cord in the palm and 60° contracture of his right little finger MCP joint which is recurrent after a CI at 3 years. What is your preferred treatment option?	Limited open fasciectomy

that there was a difference in outcomes between CI and PNA favored CI. This could be a product of their training/personal experience, national marketing campaigns for collagenase, or their own interpretation of the literature. In an RCT evaluating reduction in contracture by 50% or more relative to baseline in 50 patients, clinical improvement at 2 years was maintained in 7% (2/29) of patients with CI and 29% (6/21) of patients with PNA.⁶ In another RCT of 140 patients with 1 year of follow-up, 90% of both groups (PNA and CI) retained full extension of the treated MCP joint.⁵ Another 1-year RCT of 93 patients found 70% reduction in deficits in both the CI and PNA groups.²³ A recent meta-analysis of 10 studies reported that joint movement analysis revealed a difference between means of less than 10%, indicating equivalent clinical efficacy in the short and medium term.⁹

Practice pattern questions

Questions about PPs allowed the respondent to choose how they managed controversies within their own practice, without a correct or incorrect answer. Table 2 summarizes the PP questions and the most commonly selected answer choices. Please see the Appendix E1 (available on the *Journal's* website at www.jhsgo.org) for a full listing of survey questions and answers.

There are several points we believe are worth highlighting:

1. Respondents felt strongly about “no treatment” for mild painless disease (91%), with only 8% recommending either orthosis fabrication, therapy, or cortisone injection. Thus, it appears that patient education regarding the criteria for intervention in the future is the most critical early step.
2. There was a disagreement regarding how to best manage the initial presentation with a painful nodule. While 57% of respondents favored a cortisone injection, a considerable difference in opinion remains.
3. The respondents strongly favored percutaneous treatment for moderate central cords in the palm causing MCP contractures by 4:1 over open treatment. However, there was a close split between collagenase (40%) and PNA (32%), which may reflect how similar the outcomes are between these 2 treatments, or differences in age, comfort level, and training of the physician. Regardless of collagenase versus PNA, there was similar disagreement on postoperative protocols. While night orthosis fabrication only was the most common for both procedures, this

is only used by approximately 50% to 65% of those who perform the procedures. Full-time orthosis fabrication and supervised hand therapy were rarely used.

4. There was considerable difference in opinion as to the favored surgical incision for open fasciectomy of larger contractures for both the MCP and PIP joints. While a Bruner incision with Z-plasties to achieve closure was preferred (36%), not far behind were partial closure, leaving a transverse component open in the palm (26%), and a longitudinal incision with Z-plasties to achieve closure (23%). Skin grafting was not favored.
5. In the setting of recurrent isolated MCP joint disease 3 years after CI, interestingly, 57% of respondents would proceed directly to limited open fasciectomy, with only 24% choosing repeat CI and 18% PNA. It is unknown if that preference would be the same if PNA were the index procedure, as that tissue bed would likely be different from one in which collagenase had previously been used. Differential distortion of the tissue bed could make the physician more inclined to convert to an open procedure.

In conclusion, while there are mixed levels of evidence and study quality within the existing literature on DD, this literature can provide reasonably good guidance within several areas discussed in this survey, and it is important that hand surgeons are well informed in those areas. While >75% of physicians answered 5 of 13 of the EBP questions with the preferred answer, the remainder of the questions had a considerable number of erroneous or less preferred responses. The items with less preferred answers tended to fall into the categories of percutaneous management and nonsurgical/postoperative management of DD. The reason why is unclear, but these would be good areas of focus for hand surgeons to optimize their management of DD. Our practice pattern questions showed that multiple differences of opinion remain in managing DD, especially how to manage the painful nodule, CI versus PNA for preferred percutaneous technique, and choice of surgical incision for open fasciectomy. Staying aware of the common practice patterns among our fellow hand surgeons and aware of what the literature most supports can help us navigate those differences.

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