Quality of life following surgery for congenital or acquired trigger finger

Untersuchung der Lebensqualität nach chirurgischer Versorgung der angeborenen und erworbenen Ringbandstenose

Abstract

Background: Evaluation of quality of life following surgical release of the first annular flexor tendon pulley in children suffering from pediatric trigger thumb in comparison to adult patients with trigger finger.

Material and methods: All patients who underwent an A1 tendon pulley release between 2006 and 2010 at a hand surgery center were reviewed retrospectively. Chart review included operation type, length of hospital stay, and type of anesthesia. Patient satisfaction was assessed using two validated hand questionnaires, the Disabilities of the Arm, Shoulder and Hand (DASH) Outcome Measure and the German Michigan Hand Outcomes Questionnaire (MHQ).

Results: A total of 13 children and 147 adults were included in the study. No postoperative complications or recurrence were observed in the pediatric patient population. Postoperative DASH score in children was 0±0 and in adults 14±2. Postoperative German MHQ score was 97±3 in children and 84±2 in adults. Patient satisfaction was rated positive in all children and in 87% of adults; all children and 93% of the adults would undergo this procedure again.

Conclusions: The surgical release of the A1 pulley in children and adults is a safe and low-risk procedure. Postoperative quality of life, especially in children, is high; patients and parents were highly satisfied. Therefore, the surgical approach should be recommended as a first-line treatment of the trigger finger in all age groups.

Keywords: pediatric trigger thumb, open release, DASH, German MHQ

Zusammenfassung


Introduction

The measurement of quality of life following surgical procedures of the hand is an evolving field. Beyond the functional aspect, issues such as daily activities and their impairment may play a substantial role for the individual affected by a hand disorder. The pediatric trigger thumb usually presents between six months and two years of age. The interphalangeal joint of the thumb is usually locked in flexion with a palpable A1 pulley known as the Notta node [1]. While mild cases do not warrant any therapy at all, steroid injections have not been accepted in this patient cohort [2]. Spontaneous resolution of pediatric trigger thumbs are observed in 12–75% of patients [3], [4], [5], [6], [7]. Surgical release of the A1 pulley is believed to be almost always successful [8], [9], [10], however to date, no follow-up data on quality of life has been published.

The trigger finger in the adult, also known as stenosing tenosynovitis, is a frequent hand disorder caused by a disparity in size between the flexor tendon and the surrounding retinacular pulley system (tendon sheath). Consecutively, the affected flexor tendon cannot glide freely and causes intermittent pain and snapping [11]. The lifetime incidence of trigger finger is 2% [12]. Another study estimates that 28 in 100,000 persons are suffering from trigger finger [13]. According to the guidelines of the British Society of Surgery of the Hand (BSSH), steroid injection is an effective therapy for trigger finger therapy with success rates varying between 49–78%. Surgery, according to the aforementioned guideline, is recommended after failed conservative treatment, for recurrent triggering after 1–2 injections of steroids, if there are severe symptoms at time of presentation, or in people who are unlikely to benefit from steroid injections [13].

We therefore sought to evaluate the quality of life following surgical release of the A1 pulley among children suffering from pediatric trigger thumb as well as in adult patients with trigger finger.

Material and methods

The study was designed as a retrospective study that included hospital chart review and patient-reported outcome assessment using the German version of the Disabilities of the Arm, Shoulder and Hand (DASH) Outcome Measure [14], [15], [16] and the validated German Michigan Hand Questionnaire (MHQ) [17].

Chart review

Subjects were identified through a computerized search by ICD-10 code (M65.3) for all patients undergoing surgery for trigger thumbs or trigger fingers in both children and adults at our department between January 1, 2006, and December 31, 2010. Data collected included age, gender, status of surgeon (resident/consultant), method of anesthesia, and postoperative symptoms or complications.

Outcome measure tools – DASH and German MHQ

The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire is an outcomes data collection instrument using a 30-item disability/symptom scale measuring components of the patient’s health-status relevant to upper-extremity conditions during the preceding week. Using the questionnaire as a self-report system, patients attribute the degree of difficulty in performing different physical activities because of problems at the arm, shoulder, or hand (21 items); the severity of each of the symptoms of pain, activity-related pain, tingling, weakness, and stiffness (5 items); as well as the problem’s impact on social activities, work, sleep, and self-image (4 items). Items are answered on 5-point Likert scales. The raw score is then transformed to a score from 0 (no disability) to 100 (most severe disability). The score for the disability/symptom scale is called the DASH score. The German version of the DASH questionnaire has been previously standardized and validated [14], [15], [16]. The Michigan Hand Outcomes Questionnaire (MHQ) has also been developed as a hand specific outcomes tool applying psychometric principles to create an instrument measuring the health status of patients with hand or wrist disorders. The questionnaire consists of 37 core questions with 5-point scales evaluating the overall hand function, activities of daily living, pain, work performance, aesthetics, and patient satisfaction with the overall hand function. A demographic section at the end of the questionnaire asks about the patients’ age, the ethnic background, and the socioeconomic status. The raw scale score is the sum of responses to each scale item, which is then converted to a score ranging from 0 (worst hand
performance) to 100 (best hand performance). The German version of the MHQ questionnaire (MHQ) has been standardized and validated by our own group [17]. The DASH Outcome Measure and the German MHQ have been accompanied by further questions about postoperative satisfaction, numeric rating scale (NRS) for pain evaluation, and respective corticosteroid therapy before surgery. In pediatric patients, parents filled out the respective questionnaires for their children. The primary endpoints of this study have been defined as the scoring values of the DASH and German MHQ questionnaires.

Surgical procedure

The surgical procedure to release the A1 pulley was performed in local or general anesthesia and in loco-regional Esmarch ischemia. A transverse incision was performed on the palmar aspect of the hand overlying the MCP joint and A1 pulley or the transverse flexor fold at the MCP joint of the thumb in children, respectively. Neurovascular structures were identified by blunt dissection down to the flexor tendon visualizing the A1 pulley. After correct identification the pulley was dissected completely, followed by traction on the flexor tendon proximal to the A1 to exclude persistent triggering or locking of the respective finger. After meticulous hemostasis, the skin was closed using absorbable sutures in children and non-absorbable sutures in adults; in the latter, sutures were removed 10–12 days postoperatively. The surgical procedure was finished by application of a bulky soft dressing. An early postoperative exercise regimen was applied in all patients after wound healing was complete.

Results

Demographic data

A total of 160 patients were operated on between 2006 and 2010 and were invited to participate. The study sample comprised 13 children (7 girls; 6 boys) and 147 adult patients (87 women; 50 men). The mean age of the children was 5±3 years, that of adult patients was 61±14 years. The chart review data presented in this study were obtained from this entire cohort. A total of 73 patients responded to our invitation and filled out the DASH and German MHQ questionnaires. Mean follow-up time in adults has been 33±1 months and in children 33±3 months postoperatively.

General patient characteristics

Most of the children were operated under general anesthesia (77%). A brachial plexus block was used in 8% and local anesthesia in 15% of the pediatric patients (Figure 1). In adult patients, these ratios were reversed, with most of the adult patients operated in local anesthesia (78%), and only 9% operated under general anesthesia and only 2% with a regional anesthesia (Figure 1).

Six adult patients (4%) received preoperative steroid treatment with an average of 2±1 injections, but only half of them had a profit by this treatment of more than a month. Surgery has been performed as an outpatient surgery in 82% of adults but only in 23% of the children. Here, most children have been admitted to the ward (77%) for postoperative monitoring. Mean operating time was 17±2 min in children and 19±1 min in adults. 85% of the children and 93% of the adult patients have been operated by a consultant. Patient satisfaction with the operative procedure was rated positive in all pediatric patients and in 87% of adults. All children and 93% of the adults would undergo this procedure again (Figure 2). Postoperative complications were reported by 21% of all adult patients (Figure 3). Furthermore, only adult patients reported post-operative pain, with values reaching an average of 0.7/10 numeric rating scale (NRS; resting) and 1.4/10 NRS (stress).
Postoperative DASH score

In children, the mean DASH score was 0±0 and in adults 14±2 (95% confidence interval (CI) 15–12, Figure 4A); subscores of adult DASH were DASH work 11±3 (95% CI 12–9) and DASH sport 15±4 (95% CI 17–13).

Postoperative German MHQ score

In children, the mean German MHQ score was 97±3 (95% CI 99–95) and in adults 84±2 (95% CI 85–82, Figure 4B). German MHQ subscores for adults were 84±3 (95% CI 85–82) for the German MHQ work and 20±3 (95% CI 22–18) for the German MHQ pain.

Discussion

The main rationale of this study was to assess the quality of life following surgical release of a trigger thumb in children in comparison to trigger fingers in adult patients. The current literature lacks sufficient data from randomized studies or case reports. To the best of our knowledge, this is the first quantitative and standardized analysis of postoperative outcome measures after trigger finger release using two validated questionnaires for hand disorders (DASH, German MHQ) in children and in adult patients.

One of the major findings is that children present with excellent postoperative results represented by very good DASH and German MHQ scores, implying the highest levels of quality of life after surgery for trigger finger release. No recurrence of triggering or nodules and no reported functional deficit of the thumb were found in the pediatric cohort. Furthermore, children and their parents were highly satisfied with the treatment. It can therefore be concluded that the surgical procedure is a safe and low-risk method to restore the physiological function of the thumb [18]. In the adult cohort, low DASH and high German MHQ scores represent a similarly outstanding functional outcome. Compared to other publications, the adult DASH score results in this study are in the top third of reported outcomes (mean DASH between 11 and 33 points; Table 1). However, in comparison to other hand related diseases, i.e. Dupuytren disease, de Quervain’s tenosynovitis, and cubital tunnel syndrome, patients suffering from trigger digits are suffering much less, mostly caused by a lesser degree of nerval damage.

In many centers, patients undergo a corticosteroid injection prior to surgery, which is also described as the first-line treatment [19], [20], [21]. Longterm results, however, are largely missing. Another meta-analysis concluded that the percutaneous release of trigger fingers has similar efficacy to open surgical release and is superior to steroid injection [22]. In our entire patient cohort of adult patients, the injection of corticosteroids has only been performed in 4% of the patients, and a satisfying effect was only achieved in half of those injected at least two times. Furthermore, even when treated with corticosteroid injection, eventually all of those patients decided to undergo surgery. The corticosteroid injection in children seems not to be the primary choice of treatment [3], [23], [24], [25], although a study by Pechora in 1985 showed satisfactory results in children under the age of three with an initial stage of trigger thumb [2].
In contrast to a clear preference for a surgical approach in adults, in children the indication for surgery is not clear cut. A large body of literature recommending a primary surgical therapy [3], [26], [27], [28], [29], [30], [31] is matched by an equally large amount of studies and observations which suggest a conservative treatment with a delay or even complete avoidance of surgery [3], [4], [5], [6], [7]. Additionally, there is no clear answer to the question which surgical approach might be the best. While Fuentes and colleagues recommend the percutaneous approach to release the A1 pulley [32], Ramirez et al. recommend open surgery, due to the high rate of recurrences after percutaneous release [33]. However, in all cases of failed conservative treatment, painful triggering, or for those with severe hyperextension deformity of the MCP joint of the thumb, surgical release (open or percutaneous) seems to be the standard procedure [23], [30], [33], [34], [35], [36]. In these cases, it is recommended for the open release to be performed within the first 6 to 12 months after birth, latest at the age of 3 years [3], [23]. In patients younger than three years, the surgery is based on the release of the A1 pulley only. Later on, in children older than three years, different contractures might additionally be released in the course of the flexor tendon. This, however, could also be done with good postoperative results, implying that the age does not affect the outcome [3], [30], [34], [37], [38]. While adult patients choose local anesthesia for this surgical procedure by approximately 80%, the method of anesthesia in children is dependent on the age as well as on the tolerance of the child and its parents. Here, it is reported that this operation can easily be done in children between 2 to 2.5 years, while younger children cannot hold still for the surgical procedure and older ones have great fear [35]. Commonly, the pressure of financial budgets and the good possibility to perform this procedure in local anesthesia could be the basis for further debate on this topic. The hand questionnaires used in this study are reliable and validated instruments to evaluate hand disease related outcomes [14], [15], [16], [39], and can also be used for the evaluation of trigger finger patients. The study design of a cohort study might be associated with a lower level of evidence; it is however, more feasible and sufficiently strong to draw the respective conclusions [40]. One potential limitation of this study may also be the use of the DASH Outcome Measure and the German MHQ for children. However, a standardized and validated questionnaire for the evaluation of the surgical outcome and quality of life of hand disorders in children does not exist [41], [42], [43], [44]. Nevertheless, this form has been used to study the outcome of the above-mentioned question with good results, even when children were not able to answer every question. It has been reported that the DASH score is valid even if 10 percent of the items are left blank (http://dash.iwh.on.ca/). Similarly, this is true for the MHQ, where even up to 25% can be missing from one scale (http://sitemaker.umich.edu).

**Conclusion**

In summary, the surgical approach for treatment of trigger thumbs in children and trigger fingers in adults is a safe and low-risk procedure, which is associated with a high postoperative quality of life, especially in children. A controversy about the correct approach in children, however, still exists, and a clear and evidence-based strategy cannot be described. Clearly, longitudinal prospective studies are needed to solve the question which therapy option is associated with the best short and long-term outcome.
Notes

Competing interests

The authors declare that they have no competing interests.

Authorship

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References


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