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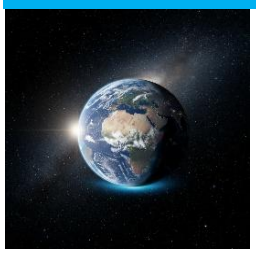

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Dupuytren's Disease: A Comparative Narrative Review of Current Treatment Modalities

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Abstract

Background. Dupuytren's contracture (DC) is a fibroproliferative disorder of the palmar fascia, characterized by progressive finger flexion deformities and impaired hand function. The condition has a multifactorial etiology, including genetic predisposition, metabolic factors (e.g., diabetes), and environmental factors such as microtrauma and occupational exposure. Its global prevalence is approximately 8%, highlighting the growing clinical need to optimize treatment strategies. The disorder is also frequently observed in athletes, particularly those engaged in sports involving repetitive hand use, such as field hockey.

Objective. The aim of this narrative review is to provide a comprehensive synthesis of current evidence on the treatment of Dupuytren's contracture (DD). The gathered data are intended to support clinical decision-making by comparing available therapeutic approaches.

Material and methods. A narrative literature review was conducted using the PubMed database, including studies published between 2016 and 2026. References cited in the included articles were also screened to identify additional relevant sources. The analysis focused on comparing the effectiveness, recurrence rates, safety profiles, and functional outcomes of available treatment modalities, including surgical, minimally invasive, and non-surgical approaches.

Results. Available evidence indicates that surgical treatment provides the most durable outcomes. Limited fasciectomy remains the reference standard in Dupuytren's disease, offering the lowest recurrence rates, though it is associated with longer recovery and a higher risk of complications. Minimally invasive approaches enable faster recovery but are associated with higher recurrence rates. Non-surgical and emerging therapies currently lack robust supporting evidence.

Conclusions. Treatment should be individualized, balancing effectiveness, recurrence risk, and recovery time. Further studies are needed to define the role of newer therapies and optimize management strategies.

Key words: Dupuytren's contracture, Dupuytren's disease, treatment of Dupuytren's disease, limited fasciectomy, dermofasciectomy, open fasciotomy, percutaneous needle fasciotomy, Clostridium collagenase histolyticum injections, Pharmacological therapy, Physical therapy

1. Introduction

Dupuytren's contracture (DC) is a fibroproliferative disorder of the palmar fascia, leading to progressive flexion deformities of the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints, and, in advanced cases, also the distal interphalangeal (DIP) joints [1,2]. The condition is progressive, and its consequence is a loss of range of motion, particularly functional extension, which represents the primary motivation for patients to seek medical intervention [3]. The pathogenesis and course of Dupuytren's disease (DD) have been divided into three stages. The initial proliferative phase is characterized by nodule formation accompanied by inflammation. During the involution phase, these nodules contract and align along the palmar fascia, forming collagenous cords. In the final residual phase, contracture develops, resulting in permanent structural changes [4]. Disease progression is variable, with flexion deformities developing in approximately 20–40% of cases [5]. The disease most commonly affects the ulnar side of the hand, involving the ring finger, followed by the little finger. The middle finger is less commonly affected, whereas thumb involvement is rare. Interestingly, the index finger is typically spared. Dupuytren's disease more often affects the dominant hand, which is associated with a more severe clinical course [6].

1.1 Epidemiology

The global prevalence of Dupuytren's disease is estimated at 8.2% [2]. Dupuytren's contracture, sometimes historically called 'the Viking disease,' was thought to originate from populations in Northern Europe, as it is more commonly observed among individuals of Caucasian descent in that region. [7]. However, according to a recent meta-analysis, the highest prevalence of Dupuytren's disease is reported in Africa (17.2%), while the lowest is observed in the Americas (2.3%) [2]. Moreover, no genetic link to Nordic Vikings has been demonstrated [8,9]. Men are affected more frequently than women, and the incidence increases with age, peaking in both sexes between 75 and 85 years [10,11].

1.2 Etiology and Risk Factors

The etiology of Dupuytren's disease is complex and not yet fully understood; it is considered to result from the interaction of genetic and environmental factors. Numerous studies indicate a significant role of genetic predisposition in the development of DD, although no specific causative gene has been identified to date [12,13].

In addition to genetic factors, a positive correlation has been demonstrated between the prevalence of DD and diabetes, with both disease duration and glycemic control being important risk factors [14,15]. Interestingly, reports also indicate an inverse relationship between body mass index (BMI) and the risk of developing the disease. Lower BMI values are associated with higher prevalence of DD, a phenomenon particularly evident in patients undergoing bariatric surgery [14–16]. This suggests that substantial weight reduction may increase the risk of DD in obese populations [16].

Alcohol consumption is significantly associated with DD, with higher intake corresponding to greater disease risk [17]. Other recognized risk factors include smoking, hypothyroidism, hypercholesterolemia, epilepsy, and liver disease [18,19]. Significant associations have also been observed between DD and conditions such as rheumatoid arthritis, osteoarthritis, as well as the use of anti-inflammatory and antirheumatic medications. Therefore, careful consideration of these treatments is warranted, particularly regarding their potential influence on DD development. This also applies to widely available nonsteroidal anti-inflammatory drugs (NSAIDs), which, despite their accessibility, are not free from adverse effects [20].

Furthermore, increased prevalence of DD has been observed among individuals exposed to prolonged, repetitive microtrauma to the hands, including athletes and manual workers, especially those using vibrating tools over many years. Occupational exposure shows a clear dose–response relationship, emphasizing the importance of thorough risk assessment in patients with Dupuytren's contracture and the need for targeted education [21].

For athletes, early identification of high-risk groups is particularly important, as it may help delay disease progression and preserve hand function. Dupuytren's contracture significantly limits the ability to perform training and achieve optimal athletic performance. Those most at risk include individuals engaged in sports involving high hand strain, such as climbing and

hockey [22]. In studies involving field hockey players, DD was observed in 51.7% of participants, compared to 13.8% in the control group [23].

Increasing awareness among at-risk populations through educational initiatives may provide opportunities for prevention, early intervention, and modification of contributing factors, such as workplace conditions, use of personal protective equipment, and optimization of training ergonomics [22].

1.3 Impact on Quality of Life

Dupuytren's contracture is an irreversible, typically progressive condition that can cause pain and discomfort, potentially leading to limitations in daily activities. Patient reports indicate that the disease is also associated with mood deterioration, social withdrawal, and feelings of aging and embarrassment [24]. Consequently, individuals with DD experience a significant reduction in quality of life.

Wilburn et al. conducted qualitative interviews with patients, identifying two main categories of disease impact: activity limitation and diminished quality of life. The first category included difficulties with dressing, grasping objects, and performing hygiene-related tasks. The second encompassed six domains of need: physiological, safety, social, emotional, self-esteem, and cognitive. The study results indicate that DD exerts a substantial negative effect on both activity levels and overall patient quality of life [25].

These findings highlight the need for new treatment approaches aimed at preserving patients' quality of life. Epidemiological data clearly show that DD is an increasingly common health problem that brings patients to medical attention. Given these trends, developing new conservative strategies that emphasize early diagnosis, disease-modifying interventions, and minimally invasive treatments is particularly important. Traditional surgical methods remain primarily applicable in advanced cases of DD; however, they are associated with prolonged recovery, risk of complications, and considerable healthcare system burden [10,11]. The aim of this review is to provide a concise synthesis of current scientific evidence regarding the management of Dupuytren's disease.

2. Surgical Approaches

Surgical treatment is primarily indicated in advanced stages of the disease, particularly in cases of rapid progression and significant loss of hand function. There is no clearly defined threshold for surgical qualification, and therapeutic decisions are made on an individual basis. Nevertheless, a general consensus suggests that intervention should be considered in the presence of metacarpophalangeal joint contracture exceeding 30° or proximal interphalangeal joint contracture greater than 15°. A commonly used method for assessing the severity of contracture is the Table-top test, which involves attempting to place the hand flat on a table-inability to perform this maneuver constitutes an indication to consider surgical treatment [26]. To date, surgical procedures have remained the mainstay and most effective treatment option; however, they are associated with the highest risk of complications, including injury to neurovascular bundles, joint stiffness, complex regional pain syndrome, and early wound-healing complications presenting with a broad spectrum of symptoms. IIn addition to complication risk, disease recurrence is a key endpoint in studies evaluating surgical techniques [27]. The commonly accepted criteria for treatment success include reduction of total extension deficit (TED) to <5°, whereas recurrence is defined as the reappearance of contracture exceeding 30° [28].

2.1 Current Treatment Trends

Carr et al. conducted a survey study among active members of the American Society for Surgery of the Hand (ASSH) to evaluate current trends in the management of Dupuytren's disease. The response rate was 23.8%, with the majority of respondents being board-certified orthopedic surgeons. The results indicated that limited fasciectomy was the preferred treatment for primary Dupuytren's disease involving both the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints. Additionally, 87.1% of respondents considered fasciectomy to provide the longest recurrence-free interval. In contrast, when the disease involved only the MCP joint, respondents more frequently preferred collagenase injections (48.5%) over percutaneous needle aponeurotomy (24.4%) and limited fasciectomy (20.8%). Although collagenase was regarded as an effective therapeutic option, 51.3% of respondents considered its cost to be disproportionate to its clinical benefits [28]. Despite study limitations, including a relatively low response rate, the findings offer valuable insights into current treatment trends

and support cautious conclusions. However, further studies involving larger and more representative populations are required to confirm these observations.

Changes in treatment trends were also demonstrated by Lipman et al., who analyzed data from patients with primary Dupuytren's disease in the PearlDiver database, considering treatment modalities such as open fasciotomy, open fasciectomy, and collagenase Clostridium histolyticum (CCH) injections. The results confirmed previously reported epidemiological data, indicating an increasing prevalence of the disease and a growing number of patients seeking medical care. Between 2007 and 2014, the number of patients nearly tripled. Despite this rise, the proportion of patients undergoing procedural treatment remained relatively stable, with a slight downward trend, at approximately 41%. Fasciectomy remained the most commonly performed procedure; however, its utilization significantly decreased to 21%. A similar decline was observed for fasciotomy, which dropped to 3%. Meanwhile, the rate of percutaneous needle aponeurotomy (PNA) remained stable at approximately 5%. By 2014, Collagenase Clostridium histolyticum (CCH), introduced in 2010, accounted for 11% of treatments. These findings indicate a clear shift toward less invasive techniques associated with shorter recovery times [29]. More recent studies, also utilizing PearlDiver data from 2012–2019 and conducted by Gordon et al., confirm the previously described trends and further expand the analysis to include treatment costs across different modalities. The results show that fasciectomy remains the most commonly performed procedure, while the use of collagenase *Clostridium histolyticum* has remained stable since its introduction. Among all analyzed procedures, percutaneous needle aponeurotomy was associated with the lowest costs, whereas the costs of CCH and surgical treatments were comparable [30].

2.2 Limited Fasciectomy (LF)

Limited fasciectomy (LF) is a well-established and currently the most commonly performed treatment for Dupuytren's disease in the United States and Europe; therefore, it may be considered the reference standard for other treatment modalities and will be regarded as such in this study [30,31]. Partial fasciectomy involves the surgical excision of only the pathologically altered cords and nodules of the palmar fascia. The choice of skin incision technique depends on the severity of the contracture and the extent of associated skin deficiency. Mild contractures (<30°) are typically managed using the Bruner approach, while moderate skin deficiency may be addressed with Y–V plasty. In more advanced cases, Z-plasty is commonly employed. In severe forms of the disease, particularly when significant palmar skin

deficiency is present, the McCash open-palm technique may be used, in which the wound is left to heal by secondary intention. Postoperative immobilization is essential in this technique to prevent secondary contractures [32].

A major limitation of fasciectomy is the requirement for an operating room setting, most commonly under general anesthesia or regional nerve block, which is associated with additional perioperative risks. Another important drawback is the relatively long recovery period, typically around 3 months, although return to basic activities of daily living is usually possible within 2–3 weeks.

Postoperative hand rehabilitation is recommended for a minimum of 3 months, with or without a removable night splint [31,33]. However, the effectiveness of night splinting remains controversial and will be discussed later in this review.

Denkler conducted a literature review assessing the safety of fasciectomy for the treatment of primary Dupuytren's disease. Among postoperative complications, the most frequently reported were wound healing disturbances, occurring in approximately 23% of patients. Other common complications included postoperative scar pain (about 17%), paresthesia (13%), and hypoesthesia (10%). Less frequent complications (<10% of cases) included inflammation, reflex sympathetic dystrophy, infection, or hematoma formation [34]. Long-term complications may include persistent sensory disturbances in surgically treated areas, cold intolerance, and joint stiffness, with an overall risk of complications estimated at 3.6–39.1% [31].

Several studies have also evaluated the risk of disease recurrence following this treatment. In the most recent systematic review of prospective data, Nocek et al. compared the likelihood of recurrence of Dupuytren's disease after limited fasciectomy (LF), Clostridium histolyticum collagenase injection (CCH), and needle aponeurotomy (NA). The study found that LF demonstrated the lowest recurrence rate (16.5%) [35]. Van den Berge et al. reported that the total extension deficit (TED) correction after limited fasciectomy (LF) in an average patient treated for primary Dupuytren's disease was 5° [36].

2.3 Open Fasciectomy (OF)

Open/Radical fasciectomy is considerably less commonly performed and is reserved for advanced stages of the disease, involving multiple fingers, as well as recurrent cases. The procedure involves extensive resection of the palmar and digital fascia, including tissues that are not pathologically altered [19]. Although this method may carry a lower risk of recurrence

than limited fasciectomy, it is associated with a higher complication rate [37]. The most common complications include skin necrosis, hematoma (most frequently observed), inflammatory reactions, neurovascular injuries, digital ischemia, edema, and infections [38].

2.4 Dermofasciectomy (DF)

The most radical surgical treatment is dermofasciectomy (DF) with skin grafting, primarily indicated for patients with recurrence after limited fasciotomy (LF) or in severe cases of primary disease [31]. The procedure involves excision of both healthy and pathologically altered tissue, including the fascia, subcutaneous tissue, and the overlying palmar skin. The exposed structures, including tendons and neurovascular bundles, are then covered with a full-thickness skin graft, most commonly harvested from the forearm or upper arm [39]. This method is associated with the highest rate of severe complications, but due to its radical approach, it carries the lowest risk of recurrence, estimated at approximately 8.4% over a 5-year follow-up period. Major limitations include an extended recovery period (3–8 weeks to return to light work), risk of graft failure, scarring at the graft site, sensory disturbances, and possible mismatch in skin color and texture [31,40].

2.5 Pull-Through Technique

Maruccia et al. developed a promising, novel minimally invasive approach for treating Dupuytren's disease, known as the pull-through technique. The procedure involves making small skin incisions over the affected cords and then dissecting them from the overlying skin by creating subcutaneous tunnels. The pathological cords are then freed from deeper structures, elevated, and removed through the previously created tunnels. Using specialized guides, the vessels of the palmar arch are protected from injury, resulting in a low risk of iatrogenic damage to neurovascular bundles and tendons.

The authors report that the procedure can be performed in an outpatient setting under local anesthesia, without the need for an operating room, an anesthesiology team, or patient hospitalization, which represents a clear advantage. In a study involving 52 patients, outcomes were assessed before the intervention and at 24 months post-procedure. The primary endpoint was the efficacy and durability of the technique. Complete correction of deformity (residual contracture <5°) was achieved in 86.9% of treated fingers. Disease recurrence (defined as deformity >20°) occurred in 15.4% of patients. Early complications were mild (8.2–11.5%) and included wound healing issues, pain, and swelling, all resolving within one month. Importantly,

no severe late complications, such as tendon rupture or neurovascular bundle injury, were observed. The recurrence rate of 15.4% observed at the final follow-up is relatively low compared to other treatment modalities [41]. Based on these results, the pull-through technique appears to be a valuable therapeutic alternative to established methods in terms of both efficacy and safety. However, definitive evaluation requires studies on larger patient cohorts with longer follow-up periods [41].

3. Percutaneous Treatment Methods

Percutaneous techniques represent an intermediate approach between surgical and conservative management. The primary advantages of these methods include a low incidence of serious complications, rapid recovery, and the possibility of performing the procedure under local anesthesia in an outpatient setting, which increases accessibility for patients. In terms of cost, these approaches are heterogeneous: percutaneous needle fasciotomy (PNF) is among the least expensive, whereas collagenase therapy (CCH) is among the most costly. Limitations of these techniques include the need for repeated procedures and a higher recurrence rate compared to surgical methods.

3.1 Percutaneous Needle Fasciotomy (PNF)

PNF is one of the least invasive treatment methods, involving the mechanical division of pathological collagen cords using a fine needle inserted subcutaneously [31]. It is particularly effective in the early stages of the disease [37]. Therapeutic effects are achieved immediately, with a mean recovery time of approximately 5.5 days [40,42]. Although there is a theoretical risk of injury to neurovascular bundles, studies indicate that such complications are rare and primarily occur around the interphalangeal joints; therefore, the procedure is generally not recommended for PIP contractures [42,43]. The risk of injury can be further minimized by using the smallest effective dose of local anesthetic and by actively monitoring patient-reported symptoms, including paresthesia [42,43]. Limitations of this technique include reduced efficacy in advanced stages of the disease and the inability to remove pathologically altered tissue [39,42].

3.2 Collagenase Clostridium histolyticum (CCH)

Treatment with collagenase involves the local injection of an enzyme that degrades pathological type I and III collagen fibers (metalloproteases) while sparing type IV collagen, thereby

preserving the integrity of neurovascular structures [38,40]. After the injection, a manipulation is performed to rupture the weakened cord. Recovery typically ranges from 1 to 10 days [31]. Although this method is associated with a relatively high incidence of adverse events, these are usually mild and include pain, swelling, and hematomas [37]. Serious complications, such as tendon rupture, occur at a frequency comparable to limited fasciectomy (~4%) [31,44]. Initially, CCH was approved for the treatment of advanced stages of the disease, but it is now also used in earlier stages [45]. The main limitation of this method remains its high cost, particularly since repeat injections are often necessary [46].

4. Comparison of Methods

Van den Berg et al. published the most recent systematic review with meta-analysis, including 211 studies, summarizing the outcomes of treatment with limited fasciectomy (LF), percutaneous needle fasciotomy (PNF), and *Clostridium histolyticum* collagenase (CCH) [36]. The analysis showed that the total extension deficit (TED) was lowest in the LF group, approximately 5°, and highest after PNF. The results for CCH were intermediate. Regarding safety, the lowest complication rate was observed in the PNF group (16%), with the majority consisting of mild, local adverse events that resolved with standard care. In the LF group, the complication rate was 22%, while in the CCH group it reached 68%, although the vast majority were mild. The rate of serious complications was low and similar across all groups, but most frequently occurred after surgical treatment (LF). Recurrence rates were also evaluated, defined as an increase in total extension deficit (TPED) of ≥30° compared to the result achieved 4–12 weeks after treatment. The median follow-up period was 36 months. The highest recurrence rate was observed after CCH (41%), followed by PNF (33%), and the lowest after LF (10%). However, it should be emphasized that the reliability of these results is limited, as the analysis was based on only three studies. The authors also noted substantial heterogeneity in patient-reported treatment outcomes, which prevented a full meta-analysis [36]. The reported recurrence rates differ from widely accepted data, according to which collagenase treatment is associated with comparable or lower recurrence risk. These findings are supported by high-quality prospective studies, indicating the need for further verification of the available data [35,46–49].

In a similar systematic review with a comparative analysis of CCH with PNF, and LF published in 2025, Cevik et al. found no significant differences between CCH and PNF in terms of efficacy and recurrence rates [49].

In a systematic review of prospective studies published in 2026, Nocek et al. focused on assessing the probability of Dupuytren's contracture recurrence after limited fasciectomy, percutaneous needle fasciotomy, or *Clostridium histolyticum* collagenase. The lowest recurrence rate was observed in the LF group (16.5%), intermediate in the CCH group (32.5%), and highest among patients treated with PNF (46.4%) [35].

Seth et al., in a 2025 systematic review with meta-analysis, compared PNF and CCH based on 11 studies including 1,443 patients [47]. The incidence of complications, such as swelling, lymphadenopathy, or itching, was significantly lower in the PNF group. No serious adverse events, such as tendon rupture or neurovascular injury, were reported in any of the groups. Recurrence rates during the first 2 years and at 5 years of follow-up were comparable between the methods, although differences among studies became apparent in the 2–3-year period after the procedure. No significant differences were observed in terms of improvement in extension deficit, residual flexion, reintervention rates, or patient-reported outcome measures (PROMs) [47].

Räisänen et al. initiated a promising prospective, randomized, multicenter study in 2017 comparing the efficacy and cost-effectiveness of CCH, PNF, and LF in both short- and long-term follow-up [48]. The primary endpoint is the treatment success rate at 5 years, defined as at least a 50% reduction in contracture along with patient satisfaction and acceptance of the treatment. Although the study is still ongoing (with a planned follow-up period of 10 years), the results published to date indicate that in the short term, the effectiveness of the methods is comparable. However, at 2 years, the highest success rate is observed in the LF group, followed by CCH, with the lowest rate in the PNF group [48].

5. Postoperative management

Appropriate postoperative rehabilitation is crucial for achieving optimal treatment outcomes. It is typically initiated within 3–5 days after surgery and should be continued for at least 3 months. The rehabilitation program includes regular exercises to improve range of motion, scar therapy, edema reduction, and the use of static and dynamic splints [38].

There is a lack of high-quality evidence supporting the effectiveness of splinting. Ruettermann et al. suggest that patients treated with PNF may benefit from their use [31]; however, a

systematic review by Rolla and Hardison found no significant differences in range of motion or functional outcomes with the addition of night splinting [50].

Lorenz et al. conducted a small prospective study involving 35 patients to assess the impact of postoperative hand therapy on perfusion, oxygenation, and edema reduction in patients with Dupuytren's disease. Patients underwent standardized physiotherapy on postoperative days 1 and 2 following limited fasciectomy (LF). Rehabilitation included manual lymphatic drainage of the fingers and hand, wound mobilization through massage and compression, followed by stretching and passive movements of all hand joints, as well as slow active movements. After each session, patients reapplied a compression splint. Assessment using hyperspectral imaging demonstrated improved oxygenation and reduced edema [51].

	RECURRENCE RATE (%)	MEAN FOLLOW-UP (YEARS)	TED (degrees)	COMPLICATION RATE (%)	COMMON COMPLICATIONS	HAND FUNCTION RECOVERY
LF	16,5 [35] or 10 [36]	5 [35] or 3 [36]	5 [36]	22 [36]	Wound issues (23%), scar pain (17%), paresthesia (13%), hypoesthesia (10%) [31]	2-4 weeks [31]
DF	8,4 [40]	5 [40]	Not reported	12 [31]	Higher risk of severe complications: wound dehiscence 10%, skin tears 8%, CRPS 4%, vessel injury 6%, nerve injury 6% [31]	3-8 weeks [31]
Pull-Through Technique	15,4 [41]	2 [41]	3,4 ± 2,3 (0–12) [41]	8,2 [41]	Early complications- wound healing issues [41]	Not reported
NA	46,4 [35] or 33 [36]	2-5 [35] or 3 [36]	10 [36]	16 [36]	Early procedure- related complications, serious and late complications are very rare [42]	5,5 days [42]
CCH	32,,5 [35] or 41 [36]	2-7 [35] or 3 [36]	8 [36]	64 [36]	One or more minor local complications [36]	1–10 days [31]

Table 1. Summary of key aspects, efficacy, and complications of the various treatment methods used in patients with primary Dupuytren's contracture

6. Non-surgical approaches

With increasing awareness of Dupuytren's disease in recent years, there has been growing interest in effective non-surgical treatments, particularly in the early stages of the disease. Special attention has been given to pharmacological therapies, while reports on physiotherapy and radiotherapy will also be briefly discussed.

Although surgical interventions are effective, not all patients are willing or eligible to undergo such procedures. Therefore, strategies aimed at slowing disease progression or halting it in its early stage are being explored. In patients with stable disease that does not cause pain or functional impairment, a watchful waiting approach is recommended. In these cases, regular monitoring of the patient's condition is crucial, with follow-up visits suggested every 6 months to promptly identify any progression of contracture [38].

6.1 Rehabilitation

Maintaining hand function and proper range of motion is essential to prevent adhesions. Various tissue mobilization techniques are used in physiotherapy, ranging from conventional methods such as massage and stretching exercises to heat therapy and ultrasound. These approaches have been shown to provide noticeable benefits in patients with early-stage disease [38,39].
Extracorporeal shockwave therapy (ESWT) is a novel, non-surgical procedure. Yazdani et al. conducted a systematic review evaluating its effects on pain reduction and hand function, as well as nodule size assessed by ultrasound, which was reported to decrease following treatment. Available evidence suggests that ESWT can significantly reduce pain, improve hand function, and increase patient satisfaction, with no significant adverse events observed. In cases of disease recurrence, pain symptoms are generally milder than prior to therapy [52].

6.2 Steroid Injections

Among the various pharmacological approaches for early-stage Dupuytren's disease (DD), only intradermal steroid injections have demonstrated reasonable support in the literature. These injections may be particularly beneficial for patients with painful nodules [53]. Studies have shown that steroid therapy can reduce inflammation and slow the progression of contracture [37]. This treatment appears to carry a relatively low risk, although adverse effects such as subcutaneous fat atrophy and pigmentary changes have been reported, and there is also a potential risk of tendon rupture [13,38,53]. It should be noted, however, that the therapeutic effects are generally temporary, with recurrence occurring in approximately 50% of patients within three years, often necessitating repeated injections (on average three treatments) [37,39].

6.3 Pharmacotherapy

Pharmacological approaches for Dupuytren's disease focus on the molecular mechanisms underlying pathogenesis, aiming to inhibit key pathways responsible for the initiation and progression of pathological tissue proliferation. Increased expression of transforming growth factor beta (TGF-β) is considered a significant factor in disease pathogenesis [44]. Improved understanding of the molecular basis of the condition has led to the identification of tumor necrosis factor (TNF) as a potential therapeutic target. Promising studies are currently evaluating the efficacy of intradermal adalimumab injections in affected tissues [44,45].

Pharmacotherapy in Dupuytren's disease also includes drugs addressing comorbidities that predispose to or exacerbate contracture, such as diabetes. Studies by Baeri et al. demonstrated that metformin, in addition to its antidiabetic effects, inhibits TGF-β–induced expression of fibrosis markers and reduces contraction in fibroblasts derived from palmar tissue [54].

6.4 Radiotherapy

Radiotherapy has been proposed to exploit the effects of ionizing radiation to inhibit the proliferation of myofibroblasts, considered the pathogenic cells responsible for palmar contracture. However, the studies conducted to date have been of low methodological quality, and the reported outcomes have been largely unpromising. Additionally, radiotherapy carries a risk of adverse effects [44,45].

7. Conclusions

In recent years, musculoskeletal disorders have gained increasing attention in the context of healthcare. In this narrative review, we focused on analyzing key aspects of the available treatment options for Dupuytren's disease, emphasizing existing discrepancies and their relevance in clinical decision-making. The choice of optimal therapy should be individualized, as the relative importance of various endpoints- such as treatment efficacy, risk of adverse events, recovery time, and costs- may differ for each patient. It is important to note that none of the current treatment options are without limitations. This review provides a concise synthesis of current evidence, which may assist clinicians in selecting the most appropriate therapeutic strategy tailored to the individual patient's needs [Table 1]. Conservative treatment methods are still not widely implemented in clinical practice and largely remain under investigation. Their inclusion in this review highlights current research directions and potential future therapeutic opportunities.

Disclosure

Supplementary Materials:
Not applicable.

Author Contributions

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References:

1. Grazina R, Teixeira S, Ramos R, Sousa H, Ferreira A, Lemos R. Dupuytren's disease: where do we stand?. *EFORT Open Rev*. 2019;4(2):63-69. Published 2019 Feb 20. doi:10.1302/2058-5241.4.180021

2. Salari N, Heydari M, Hassanabadi M, et al. The worldwide prevalence of the Dupuytren disease: a comprehensive systematic review and meta-analysis. *J Orthop Surg Res*. 2020;15(1):495. Published 2020 Oct 28. doi:10.1186/s13018-020-01999-7
3. Ball C, Pratt AL, Nanchahal J. Optimal functional outcome measures for assessing treatment for Dupuytren's disease: a systematic review and recommendations for future practice. *BMC Musculoskelet Disord*. 2013;14:131. Published 2013 Apr 10. doi:10.1186/1471-2474-14-131
4. Eftimie G, Eftimie R. Quantitative predictive approaches for Dupuytren disease: a brief review and future perspectives. *Math Biosci Eng*. 2022;19(3):2876-2895. doi:10.3934/mbe.2022132
5. Layton T, Nanchahal J. Recent advances in the understanding of Dupuytren's disease. *F1000Res*. 2019;8:F1000 Faculty Rev-231. Published 2019 Feb 28. doi:10.12688/f1000research.17779.1
6. Mansur HG, Oliveira ER, Gonçalves CB. Epidemiological analysis of patients with Dupuytren's disease. *Rev Bras Ortop*. 2017;53(1):10-14. Published 2017 Dec 14. doi:10.1016/j.rboe.2017.12.003
7. Yuan S, Furniss D, Larsson SC, Leffler DA, Ludvigsson JF. Celiac Disease and Incident Dupuytren's Contracture: A Matched Nationwide Cohort Analysis. *Clin Epidemiol*. 2025;17:481-484. Published 2025 May 24. doi:10.2147/CLEP.S518939
8. Flatt AE. The Vikings and Baron Dupuytren's disease. *Proc (Bayl Univ Med Cent)*. 2001;14(4):378-384. doi:10.1080/08998280.2001.11927791
9. Ng M, Lawson DJ, Winney B, Furniss D. Is Dupuytren's disease really a 'disease of the Vikings'?. *J Hand Surg Eur Vol*. 2020;45(3):273-279. doi:10.1177/1753193419882851
10. Broekstra DC, Kuo RYL, Burn E, Prieto-Alhambra D, Furniss D. Dupuytren Disease: Prevalence, Incidence, and Lifetime Risk of Surgical Intervention. A Population-Based Cohort Analysis. *Plast Reconstr Surg*. 2023;151(3):581-591. doi:10.1097/PRS.0000000000009919
11. van Straalen RJM, de Boer MR, Vos F, Werker PMN, Broekstra DC. The incidence and prevalence of Dupuytren's disease in primary care: results from a text mining approach on registration data. *Scand J Prim Health Care*. 2025;43(1):173-180. doi:10.1080/02813432.2024.2416678
12. Layton TB, Williams L, Nanchahal J. Dupuytren's disease: a localised and accessible human fibrotic disorder. *Trends Mol Med*. 2023;29(3):218-227. doi:10.1016/j.molmed.2022.12.001

13. Żyluk A. Dupuytren's disease - what's new: a review. *Pol Przegl Chir*. 2022;95(6):53-61. doi:10.5604/01.3001.0016.0058
14. Backman M, Nordenskjöld J, Perez R, Rydberg M. Associations of Glycemic Control and Diabetes Duration With Dupuytren Disease in Men and Women With Type 1 and 2 Diabetes. *Plast Reconstr Surg Glob Open*. 2026;14(1):e7435. Published 2026 Jan 28. doi:10.1097/GOX.0000000000007435
15. Green HD, Burden E, Chen J, et al. Hyperglycaemia is a causal risk factor for upper limb pathologies. *Int J Epidemiol*. 2024;53(1):dyad187. doi:10.1093/ije/dyad187
16. Burkard T, Lane JCE, Holmberg D, Thorell A, Burden AM, Furniss D. The association of bariatric surgery and Dupuytren's disease: a propensity score-matched cohort study. *J Hand Surg Eur Vol*. 2022;47(3):288-295. doi:10.1177/17531934211062023
17. Wang Z, Wang Z, Yan Z, Xu Z, Gao A. Smoking, alcohol consumption and risk of Dupuytren's disease: a Mendelian randomization study. *BMC Med Genomics*. 2023;16(1):212. Published 2023 Sep 7. doi:10.1186/s12920-023-01650-4
18. Broekstra DC, Groen H, Molenkamp S, Werker PMN, van den Heuvel ER. A Systematic Review and Meta-Analysis on the Strength and Consistency of the Associations between Dupuytren Disease and Diabetes Mellitus, Liver Disease, and Epilepsy. *Plast Reconstr Surg*. 2018;141(3):367e-379e. doi:10.1097/PRS.0000000000004120
19. Pineda N, Ghayyad K, Beaudoin TF, et al. Epidemiology and Treatment Trends in the Management of Dupuytren's Disease From 2016 to 2022. *Cureus*. 2024;16(10):e72528. Published 2024 Oct 28. doi:10.7759/cureus.72528
20. Noordman MFN, Riesmeijer SA, Werker PMN, Nolte IM. Associations of Demographic, Lifestyle, and Clinical Factors With the Presence of Dupuytren Disease: Results from the Lifelines Cohort Study. *J Hand Surg Glob Online*. 2025;7(5):100786. Published 2025 Jul 24. doi:10.1016/j.jhsg.2025.100786
21. van den Berge BA, Wiberg A, Werker PMN, Broekstra DC, Furniss D. Dupuytren's disease is a work-related disorder: results of a population-based cohort study. *Occup Environ Med*. 2023;80(3):137-145. doi:10.1136/oemed-2022-108670
22. Novo J, Gao D, Seth I, Rozen WM. Incidence of Dupuytren's disease following hand trauma: a systematic review. *J Hand Surg Eur Vol*. 2026;51(1):6-13. doi:10.1177/17531934251360545
23. Broekstra DC, van den Heuvel ER, Lanting R, Harder T, Smits I, Werker PMN. Dupuytren disease is highly prevalent in male field hockey players aged over 60 years. *Br J Sports Med*. 2018;52(20):1327-1331. doi:10.1136/bjsports-2016-096236

24. Turesson C, Kvist J, Krevers B. Experiences of men living with Dupuytren's disease-Consequences of the disease for hand function and daily activities. *J Hand Ther*. 2020;33(3):386-393. doi:10.1016/j.jht.2019.04.004
25. Wilburn J, McKenna S, Perry-Hinsley D ...
The Impact of Dupuytren Disease on Patient Activity and Quality of Life
Journal of Hand Surgery, 38, 1209-1214 DOI: 10.1016/j.jhsa.2013.03.036
26. Boe C, Blazar P, Iannuzzi N. Dupuytren Contractures: An Update of Recent Literature. *J Hand Surg Am*. 2021;46(10):896-906. doi:10.1016/j.jhsa.2021.07.005
27. Eftimie G, Eftimie R. Quantitative predictive approaches for Dupuytren disease: a brief review and future perspectives. *Math Biosci Eng*. 2022;19(3):2876-2895. doi:10.3934/mbe.2022132
28. Carr L, Michelotti B, Brgoch M, Hauck R, Ingraham J. Dupuytren Disease Management Trends: A Survey of Hand Surgeons. *Hand (N Y)*. 2020;15(1):97-102. doi:10.1177/1558944718787281
29. Lipman MD, Carstensen SE, Deal DN. Trends in the Treatment of Dupuytren Disease in the United States Between 2007 and 2014. *Hand (N Y)*. 2017;12(1):13-20. doi:10.1177/1558944716647101
30. Gordon AM, Nian PP, Miller C, Schwartz JM, Choueka J. Comparison of Patient Demographics, Utilization Trends, and Costs of Treatment for Dupuytren's Disease in the United States From 2012 to 2019. *Ann Plast Surg*. 2023;91(5):547-552. doi:10.1097/SAP.0000000000003665
31. Ruettermann M, Hermann RM, Khatib-Chahidi K, Werker PMN. Dupuytren's Disease-Etiology and Treatment. *Dtsch Arztebl Int*. 2021;118(46):781-788. doi:10.3238/arztebl.m2021.0325
32. Hever P, Smith OJ, Nikkhah D. Dupuytren's Fasciectomy: Surgical Pearls in Planning and Dissection. *Plast Reconstr Surg Glob Open*. 2020;8(7):e2832. Published 2020 Jul 21. doi:10.1097/GOX.0000000000002832
33. Cooper TB, Poonit K, Yao C, Jin Z, Zheng J, Yan H. The efficacies and limitations of fasciectomy and collagenase clostridium histolyticum in Dupuytren's contracture management: A meta-analysis. *J Orthop Surg (Hong Kong)*. 2020;28(2):2309499020921747. doi:10.1177/2309499020921747
34. Denkler K. Surgical complications associated with fasciectomy for dupuytren's disease: a 20-year review of the English literature. *Eplasty*. 2010;10:e15. Published 2010 Jan 27.

35. Nocek M, Wakefield D, Vitale MA. Likelihood of Dupuytren Contracture Recurrence After Limited Fasciectomy, Needle Aponeurotomy or Collagenase *Clostridium histolyticum*: Systematic Review of Prospective Data With 2- to 7-Year Follow-up. *J Hand Surg Glob Online*. 2026;8(3):100979. Published 2026 Mar 5. doi:10.1016/j.jhsg.2026.100979
36. van den Berge BA, Habibi H, Dijkstra PU, et al. Outcomes of limited fasciectomy, needle fasciotomy and collagenase injection for Dupuytren's disease: a systematic review and meta-analysis of individual patient data. *J Hand Surg Eur Vol*. 2025;50(7):878-890. doi:10.1177/17531934251338349
37. Khaliq F, Orji C. Dupuytren's Contracture: A Review of the Literature. *Cureus*. 2024;16(12):e74945. Published 2024 Dec 2. doi:10.7759/cureus.74945
38. Walthall J, Anand P, Rehman UH. Dupuytren Contracture. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; February 26, 2023.
39. Dutta A, Jayasinghe G, Deore S, et al. Dupuytren's Contracture - Current Concepts. *J Clin Orthop Trauma*. 2020;11(4):590-596. doi:10.1016/j.jcot.2020.03.026
40. Denkler KA, Park KM, Alser O. Treatment Options for Dupuytren's Disease: Tips and Tricks. *Plast Reconstr Surg Glob Open*. 2022;10(1):e4046. Published 2022 Jan 27. doi:10.1097/GOX.0000000000004046
41. Maruccia M, Tedeschi P, Sisto F, Converti I, Giudice G, Elia R. Dupuytren's Disease: A Novel Minimally Invasive Pull-Through Technique. *Arch Plast Surg*. 2024;51(3):295-303. Published 2024 Mar 4. doi:10.1055/s-0043-1775882
42. Moog P, Buchner L, Cerny MK, Schmauss D, Megerle K, Erne H. Analysis of recurrence and complications after percutaneous needle fasciotomy in Dupuytren's disease. *Arch Orthop Trauma Surg*. 2019;139(10):1471-1477. doi:10.1007/s00402-019-03247-y
43. Strömberg J. Percutaneous Needle Fasciotomy for Dupuytren Contracture. *JBJS Essent Surg Tech*. 2019;9(1):e6. Published 2019 Feb 13. doi:10.2106/JBJS.ST.18.00047
44. Almadani YH, Vorstenbosch J, Efanov JI, Xu L. Dupuytren's Disease: An Outcomes-Focused Update. *Semin Plast Surg*. 2021;35(3):216-222. doi:10.1055/s-0041-1731631
45. Żyluk A. Management of early stages of Dupuytren's disease: a narrative review. *Pol Przegl Chir*. 2025;97(5):57-63. doi:10.5604/01.3001.0055.1317
46. Nann S, Kovoor J, Fowler J, et al. Surgical Management of Dupuytren Disease: A Systematic Review and Network Meta-analyses. *Hand (N Y)*. 2024;19(8):1283-1292. doi:10.1177/15589447231174175

47. Seth I, McClure V, Lim B, Cuomo R, Ross RJ, Rozen WM. Collagenase Clostridium Histolyticum Versus Percutaneous Needle Fasciotomy for Dupuytren's Disease: A Systematic Review and Meta-Analysis. *Life (Basel)*. 2025;15(2):259. Published 2025 Feb 8. doi:10.3390/life15020259
48. Räisänen MP, Leppänen OV, Soikkeli J, et al. Surgery, Needle Fasciotomy, or Collagenase Injection for Dupuytren Contracture : A Randomized Controlled Trial. *Ann Intern Med*. 2024;177(3):280-290. doi:10.7326/M23-1485
49. Cevik J, Rajaram R, Pollock M, Seth I, M Rozen W. Collagenase clostridium histolyticum for Dupuytren's disease: a comprehensive systematic review and comparative analysis against percutaneous needle aponeurotomy and limited fasciectomy. *J Plast Surg Hand Surg*. 2025;60:27-34. Published 2025 Feb 13. doi:10.2340/jphs.v60.42750
50. Roll SC, Hardison ME. Effectiveness of Occupational Therapy Interventions for Adults With Musculoskeletal Conditions of the Forearm, Wrist, and Hand: A Systematic Review. *Am J Occup Ther*. 2017;71(1):7101180010p1-7101180010p12. doi:10.5014/ajot.2017.023234
51. Lorenz FM, Henning E, Sicher C, Langner I. Effects of postoperative hand therapy in patients with Dupuytren's disease : A prospective hyperspectral imaging study. Auswirkungen der postoperativen Handtherapie bei Patienten mit Morbus Dupuytren : Eine prospektive Studie zur hyperspektralen Bildgebung. *Orthopadie (Heidelb)*. 2025;54(5):386-394. doi:10.1007/s00132-025-04631-w
52. Yazdani A, Nasri P, Baradaran Mahdavi S. The Effects of Shock Wave Therapy on the Symptoms and Function of Individuals With Dupuytren Disease: A Systematic Review. *Arch Phys Med Rehabil*. 2024;105(10):1985-1992. doi:10.1016/j.apmr.2024.05.030
53. Ball, C., Izadi, D., Verjee, L.S. *et al.* Systematic review of non-surgical treatments for early Dupuytren's disease. *BMC Musculoskelet Disord* 17, 345 (2016). https://doi.org/10.1186/s12891-016-1200-y
54. Baeri A, Levraut M, Diazzi S, et al. A role for metformin in the treatment of Dupuytren disease?. *Biomed Pharmacother*. 2022;150:112930. doi:10.1016/j.biopha.2022.112930