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Hand Function after Surgery for Dupuytren Contracture: A Multi-Center Prospective Cohort Study

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Abstract

Background: Dupuytren's disease is a common, benign fibroproliferative disorder affecting the palmar and digital fascia of the hand. This condition can lead to significant disability, morbidity, and substantial economic losses due to impaired hand function and reduced work capacity

Objective: To assess the effectiveness of surgery to improve the function of the hand for Dupuytren's disease at ALERT and Yikatit Medical college Plastic surgery treatment center, Addis Ababa, Ethiopia 2024

Methods: This multi-center prospective cohort study evaluated the effectiveness of surgery in improving hand function among patients with Dupuytren's disease. Patients who underwent surgery for Dupuytren's disease at ALERT Hospital and Yekatit Medical College between January and September 2024 were included. Hand function was assessed using the validated Southampton Patient Outcome Reporting Tool. Data analysis was performed using SPSS version 25. Normality of continuous data was assessed using histograms and the Shapiro-Wilk test. For normally distributed data, means and standard deviations (SDs) were calculated; for skewed data, medians and interquartile ranges (IQRs) were used. Categorical variables are presented as frequencies and percentages. Paired samples t-tests were used to compare mean differences for parametric data, while Wilcoxon signed-rank tests were employed for non-parametric data.

Result: This study analyzed surgical outcomes in 32 patients with Dupuytren's disease. A marked gender disparity was observed, with males comprising 93.8% (n=30) of the sample, and a mean age of 56.1 years (\pm SD 9.2). Right-hand involvement was present in 46.9% of patients. Metacarpophalangeal (MCP) joint extension deficits were predominantly Grade 1 (less than 45 degrees) in 53.1% of participants. The mean pre-surgical Southampton score was 14 (SD=2). Post-operative complications included hematoma (9.4%), infection (9.4%), and wound dehiscence (3.1%). Surgical intervention resulted in a statistically significant reduction in the total Southampton score, with a mean difference of 9.2 (95% CI 8.2, 10.2; $p < 0.0001$).

Conclusion: This study demonstrates that surgical intervention for Dupuytren's disease significantly improves hand function and quality of life, leading to a greater likelihood of returning to work for affected individuals. The observed improvements highlight the effectiveness of surgery

in restoring hand functionality and reducing the significant disability associated with this condition.

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ABBREVIATIONS & ACRONYMS

ALERT	All African Leprosy, Tuberculosis and Rehabilitation training center
DASH	Disabilities of the arm, shoulder, and hand questionnaire
DC	Dupuytren's Contracture
DF	Dermatofascectomy
LF	Limited fasciectomy
MCP	Metacarpophalangeal joint
PIP	Proximal interphalangeal joint
PNF	Percutaneous fasciectomy
ROM	Range of motion
TAE	Total active extension
TAF	Total active flexion
VSS	Vancouver scar scale

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CHAPTER ONE: INTRODUCTION

1.1. Background

Dupuytren's contracture, a prevalent disorder affecting connective tissues, arises from a complex interplay of genetic predisposition and environmental factors^{1, 2}. This benign yet progressive condition is characterized by fibrotic changes within the palmar and digital fascia, and adjacent soft tissues of the hand. Dupuytren's contracture is primarily a myofibroblastic disease and manifests as contracture deformities, most commonly impacting the ring and little fingers². The disease typically initiates with the painless formation of nodules along the lines of tension within the palmar fascia². These nodules subsequently develop into thickened, fibrous cords that progressively contract, distorting the hand's natural anatomy. The underlying pathophysiology involves uncontrolled fibroblast proliferation and excessive collagen deposition, culminating in the characteristic palmar fascial contractures. The disease's progression is staged, beginning with nodule formation, advancing to a phase of marked collagen accumulation and a shift toward myofibroblasts as the dominant cellular component.

Despite advancements in non-surgical treatments, surgery remains the cornerstone of Dupuytren's contracture (DC) management. Surgical approaches commonly employed include minimally invasive percutaneous needle fasciotomy (PNF), limited fasciectomy (LF), and dermofasciectomy (DF)³⁻⁵. PNF is a suitable option for mild to moderate contractures presenting with palpable cords and limited extension at the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints³⁻⁵. While LF represents the most common primary surgical intervention for Dupuytren's disease, DF is frequently utilized in revision surgeries. However, surgical intervention carries inherent risks. Postoperative complications, although infrequent, can include infection, hematoma formation, vascular or nerve injury, impaired wound healing, excessive scarring, edema, and the development of complex regional pain syndrome, potentially resulting in reduced finger flexibility⁶. The recovery period typically extends from three to six months, often necessitating hand rehabilitation. Thorough patient counseling is crucial, ensuring informed consent that encompasses both the potential benefits and the range of possible intraoperative and postoperative

complications associated with each surgical technique. Patients must have a comprehensive understanding of the risks and benefits before proceeding with any surgical intervention.

1.2. Statement of the problem

Dupuytren's contracture (DC) presents a significant global health problem, imposing substantial morbidity, disability, and economic burdens on individuals and healthcare systems alike. The worldwide prevalence of DC, a leading cause of hand impairment, exhibits considerable geographical heterogeneity, ranging from 0.2% to 56% across diverse populations. Recent meta-analyses paint a complex picture: a global prevalence estimate of approximately 8.2% from 85 studies, with a strikingly high 17.2% prevalence in Africa and a concerning 34.1% prevalence among individuals with diabetes. Similar variability is observed in Western populations, with a pooled prevalence ranging from 0.6% to 31.6% across 23 studies. This heterogeneity underscores the multifaceted etiology of DC and necessitates region-specific epidemiological research. The considerable financial burden associated with DC treatment further compounds the issue. While high-income countries, such as the UK, have documented mean annual surgical costs of approximately €3100 per patient (with significantly higher costs for reoperations). There are largely absent evidences from low- and middle-income countries (LMICs), particularly in Africa and Ethiopia. Existing Ethiopian research is limited, with only one cross-sectional study suggesting higher prevalence in Northern Ethiopia and disproportionately affecting middle-aged individuals. A critical knowledge gap persists regarding the effectiveness of surgical interventions in improving quality of life and hand function, along with the prevalence of postoperative complications in the Ethiopian contexts. This study directly addresses these critical knowledge gaps to inform evidence-based healthcare strategies for this prevalent and debilitating condition.

1.3. Significance of the study

This research on hand function before and after Dupuytren's contracture (DC) surgery in Ethiopian hospitals significantly advances the understanding and management of this condition within a specific context. For healthcare providers, the study's detailed assessment of pre- and postoperative hand function, including data on recurrence rates and functional outcomes, will directly inform clinical practice. This evidence will be crucial in optimizing surgical techniques, tailoring rehabilitation programs to the needs of Ethiopian patients (especially those engaged in manual labor), and ultimately, improving patient outcomes. The study addresses a critical gap in localized data, providing a much-needed foundation for evidence-based care. Policymakers will benefit from the study's epidemiological findings, which will clarify the prevalence and impact of DC on the Ethiopian population, particularly among manual laborers who represent a significant portion of the workforce. This information is essential for justifying increased resource allocation towards diagnosis, treatment, and rehabilitation services for DC. Understanding the economic consequences of the disease – lost productivity due to impaired hand function – will aid in the development of cost-effective healthcare strategies and advocate for improved access to care. The study's findings will support the development of targeted health policies addressing the unique challenges of DC in the Ethiopian context. Researchers will find this study invaluable for several reasons. Firstly, it fills a significant gap in the existing literature by providing much-needed data on DC outcomes from an under-researched region. The findings will enhance our understanding of DC epidemiology and treatment effectiveness within a specific population, contributing to the broader global knowledge base on the disease. Secondly, this study can serve as a model for future research in similar settings, highlighting methodologies and areas for further investigation. The detailed dataset will be a valuable resource for comparative studies, allowing researchers to analyze the impact of various factors on DC outcomes across different populations.

CHAPTER TWO: LITERATURE REVIEW

2.1. Burden of DD

Dupuytren's contracture (DC) significantly impacts hand function, contributing substantially to morbidity, disability, and economic burden globally. However, establishing a precise epidemiological profile for DC remains challenging due to considerable variability in reported prevalence rates across different geographic locations. This heterogeneity likely reflects a complex interplay of genetic and environmental factors, though the precise contribution of each remains unclear⁷. The existing epidemiological data are further complicated by several factors: a preponderance of studies conducted in specific regions (primarily Scandinavia and the UK); substantial variations in population demographics across studies; changes in the prevalence of associated conditions (such as diabetes); and evolving diagnostic criteria for DC⁷. A systematic review incorporating data from 49 studies revealed a consistent increase in DC prevalence with age, and a male-to-female ratio of approximately 5.9:1. Prevalence rates spanned a wide range, from 0.2% to 56%, highlighting the considerable heterogeneity across different populations and age groups⁷. A more extensive analysis encompassing 85 studies across Asia, Europe, Africa, and the Americas, encompassing an estimated population of over 6.63 million individuals, yielded a global prevalence estimate of approximately 8.2%. Strikingly, this analysis indicated the highest prevalence rate in Africa (17.2%), with a considerably elevated prevalence (34.1%) among patients with diabetes⁸. A meta-analysis encompassing 23 studies, with sample sizes ranging from 37 to 97,537 participants and age ranges spanning 18 to 100 years, revealed a substantial variability in the prevalence of Dupuytren's contracture (DC) across Western populations. The estimated pooled prevalence rate, derived from this comprehensive analysis, fell within a wide range, from 0.6% to 31.6%⁹. The considerable variability in the prevalence of Dupuytren's contracture (DC) strongly suggests a multifactorial etiology involving a complex interplay of genetic and environmental factors. While the precise contribution of each factor remains an area of ongoing research, several key risk factors have been identified. These include advancing age (with the condition typically

manifesting after age 50), male gender, smoking and alcohol consumption, diabetes mellitus, a positive family history of DC, and geographic location^{8, 10}.

2.2. Management and complications

Currently, no definitive cure exists for Dupuytren's contracture (DC); however, treatment modalities focus on restoring finger joint extension. Surgical intervention is typically indicated when metacarpophalangeal (MCP) joint contractures exceed 30 degrees, regardless of the degree of proximal interphalangeal (PIP) or distal interphalangeal (DIP) joint contracture, or in cases of symptomatic nodules. A range of treatment options are available, encompassing conservative management (observation and non-operative interventions) and surgical techniques. Surgical approaches include percutaneous needle fasciotomy (PNF), open fasciotomy (OF), injection of collagenase clostridium histolyticum (CCH), limited fasciectomy (LF), and dermofasciectomy (DF)¹¹.

CHAPTER THREE

3. OBJECTIVES OF THE STUDY

3.1 General objective

- To assess hand function before and after surgery, Scar pliability, compare pre- and post-operative joint motion and determine patient satisfaction levels for patients with Dupuytren's contracture at ALART and Yekatit 12 hospital plastic, reconstructive & hand surgery department from January to September, 2024 in Addis Ababa, Ethiopia.

3.2 Specific objectives

- To assess the sociodemographic and clinical characteristics of the participants
- To assess the hand function before and after surgery based on Patient Reported Outcome Measures (PROM) at ALART and Yekatit 12 hospital plastic, reconstructive & hand surgery department from January to September, 2024 in Addis Ababa, Ethiopia.
- To evaluate Patient satisfaction before and after surgery at ALART and Yekatit 12 hospital plastic, reconstructive & hand surgery department from January to September, 2024 in Addis Ababa, Ethiopia.

CHAPTER FOUR

4. METHODOLOGY

4.1 Study area and Period

The study was conducted in Addis Ababa, the capital city of Ethiopia which is the largest city in the country holding 527 km² areas with estimated total population of 8,938,683 in 2023 world population review. ALERT Comprehensive Specialized Hospital is the continuation and expansion of the leprosy hospital originally built by Dr. Thomas Lambie in 1922. It's one of Addis Ababa university affiliated hospitals and prestigious plastic surgery center. Three wards and an outpatient department with general, trauma, and three specialty clinics make up the plastic and reconstructive surgery department. In total, 1000 patients visit general plastic, head and neck, hand and peripheral nerve, and craniofacial clinics on a monthly basis. On average 176 people visited the hand clinic monthly. The hand clinic is the second clinic after general plastic referral clinic by patient flow. Yekatit 12 hospital is one of the oldest hospitals in Ethiopia which was established in 1923. It was founded by Dr. Ayner, a Swedish Medical Doctor, who served in the hospital as a medical director until 1936. Department of plastic surgery was established at Yekatit hospital in 2000 as burn and cleft surgery projects. Since then, it is one of one of Addis Ababa university affiliated hospitals with 3 wards and outpatient department with general plastic, burn and cleft clinics. The study was conducted for a period of 09 months (from January 2024 to September 2024)

4.2 Study Design

An institution-based multi-center prospective cohort study

4.3 Source population

All patients with Dupuytren's contracture visit plastic and reconstructive surgery department at ALERT comprehensive specialized hospital & Yekati 12 hospital medical college within the study period.

4.4 Study population

Patients diagnosed with Dupuytren's contracture who undergo surgery at plastic and reconstructive surgery department at ALERT comprehensive specialized hospital & Yekati 12 hospital medical college will be recruited during the study period.

4.5 Sample size and Sampling technique

- All patients who meet the inclusion criteria

4.6 Eligibility criteria

4.6.1 Inclusion criteria

- All patients with Dupuytren's contracture who presented to plastic and reconstructive surgery department at ALERT comprehensive specialized hospital & Yekati 12 hospital medical college with Dupuytren's contracture and operated within the study period.

4.6.2 Exclusion criteria

- Those patients who have already operated
- those who are not willing to participate.
- Patients with previous surgery on the same hand
- Loss of follow up

4.7 Data collection tools and techniques

A structured questionnaire that has information on socio-demographics, clinical symptoms, affected hand and digits, associated medical conditions, ROM assessed with goniometer, SCAR pliability with Vancouver scar scale, patient related outcome score and overall satisfaction will be prepared and patients assessed on the day of the surgery after 01 week, and 3 months post operatively. Pretesting was performed using the data collecting instrument for consistency and to reduce

variation in measurement of variables. To ensure the quality of data, one-day training will be given on the contents of the questionnaire and the purpose of the study to data collectors. The completeness of the collected data was checked and monitored by the supervisors.

4.8 Study variables

4.8.1 Dependent variable

- Southampton score

4.8.2 Independent variables

- Age
- Sex
- Surgical technique
- Hand dominance
- Post operative rehabilitation.
- Comorbidities

4.9 Operational definition

Hand function - The capacity of the hand to carry out tasks required for daily living, such as grasping, manipulating, releasing, pinching, writing, and gesturing

Range of motion- the amount of movement measured with goniometry in a particular joint or group of joints.

Degrees of movement from the initial, stationary position through active and passive movement made possible by an outside force are used to measure it

Scar pliability - the flexibility and elasticity of a scar. It describes how much a scar is able to deform or indent in response to applied pressure, and then return to its original shape

4.10 Data management and analysis

The collected data was coded and entered to EPI-INFO version 26 for proper data processing and analysis then exported to SPSS 26 software for further analysis. Normality of the distribution of continuous data was check with histogram and Shapiro test. Mean with SD calculated for normally distributed data whereas median and IQR for skewed data. The categorical variables in the study

were presented with using frequency, percentage, and compared between groups using the chi-square test. Since our sample is less than 50 the normal distribution of continuous variables was assessed using Shapiro-Wilk test. Paired sample T test was used to compare the mean difference for parametric variables while Wilcoxon Signed Rank test was employed for nonparametric data

4.11 Ethical Issues

Ethical approval for this study was obtained from the Ethical Review Board of the Department of Surgery, Addis Ababa University, College of Health Sciences. Following this approval, official permission was secured from ALERT Hospital and Yekatit 12 Hospital, the primary study sites. All collected data will be kept confidential and anonymized, and used solely for the purposes specified in this study protocol.

CHAPTER FIVE: RESULTS

This study's sample population demonstrated a marked disparity in gender representation, with males comprising 93.8% (n = 30) and females only 6.3% (n = 2). Geographic distribution showed Addis Ababa as the most represented region (43.8%, n = 14), followed by Amhara (25.0%, n = 8) and Oromia (15.6%, n = 5). Occupational diversity was evident, with farmers representing the largest group (28.1%, n = 9), followed by merchants (18.8%, n = 6), and teachers (9.4%, n = 3). Finally, marital status revealed that 84.4% (n = 27) of respondents were married and 9.4% (n = 3) were single (Table 1)

Table 1: Sociodemographic characteristics of the study participants at ALERT and Yikatit Medical college, Addis Ababa, Ethiopia

Item	Response	Frequency	Percent
Age	Mean±SD	56.1±9.2	
Sex	Female	2	6.3
	Male	30	93.8
Regions	Addis Ababa	14	43.8
	Amhara	8	25.0
	Oromia	5	15.6
	SNNPR	4	12.5
	Tigray	1	3.1
Occupation	Accountant	1	3.1
	Banker	1	3.1
	Carpenter	2	6.3
	Driver	1	3.1
	Farmer	9	28.1
	Housewife	2	6.3
	Mechanic	2	6.3
	Merchant	6	18.8
	Policeman	2	6.3
	Priest	2	6.3
	Teacher	3	9.4
	Truck driver	1	3.1
Marital status	Married	27	84.4
	Single	3	9.4
	Widowed	2	6.3

The sample population exhibited a strong right-hand dominance, with 96.9% of participants identifying as right-handed compared to 3.1% who were left-handed. Hand involvement in affected activities showed a more even distribution: 25.0% reported bilateral involvement, 28.1% left-hand involvement, and 46.9% right-hand involvement. Digit involvement varied, with the fourth digit (25.0%) and fourth and fifth digits together (31.3%) exhibiting the highest frequencies. Metacarpophalangeal (MCP) joint extension deficits were predominantly classified as Grade 1 (less than 45 degrees) in 53.1% of participants, with Grade 2 (46-90 degrees) in the remaining 46.9%. Proximal Interphalangeal (PIP) joint extension deficits were exclusively classified as Grade 1 (100%), while Thumb Extension Deficits (TED) showed a distribution of Grade 1 (21.9%), Grade 2 (71.9%), and Grade 3 (6.3%). The most common comorbidity was DM 15.6% and HTN 12.5%. The mean pre-surgical Southampton score was 14(SD= 2) (Table 2)

Table 2: Clinical profile of the study participants at ALERT and Yikatit Medical college, Addis Ababa, Ethiopia

Item	Response	Frequency	Percent
Hand dominance	Left	1	3.1
	Right	31	96.9
Involved	Bilateral	8	25.0
	Left	9	28.1
	Right	15	46.9
Involved Digit	1st thumb	1	3.1
	3 rd	5	15.6
	3 rd and 4 th	1	3.1
	3 rd , 4 th and 5 th	2	6.3
	4 th	8	25.0
	4 th and 5 th	10	31.3
	5 th	5	15.6
MCP extension deficit	Grade 1(Grade below 45)	17	53.1
	Grade 2(46-90)	15	46.9
PIP	Grade 1	32	100.0
TED	Grade 1	7	21.9
	Grade 2	23	71.9
	Grade 3	2	6.3
Comorbidity	DM	5	15.6
	Hanson's	1	3.1
	Hypertension	4	12.5
	None	22	68.8
Southampton score (Pre surgery)	Mean±SD	14±2	
Patient satisfaction	Neither satisfied nor dissatisfied- 3	3	9.4
	Somewhat satisfied- 4	12	37.5
	Very satisfied- 5	17	53.1

Surgical outcomes

Postoperative complications, such as hematoma, infection, and wound dehiscence, were uncommon among the respondents. However, a small percentage experienced these complications: approximately 9.4% developed hematoma or infection, while 3.1% experienced wound dehiscence.

Table 3: Surgical outcomes after surgical intervention for Dupuytren's contracture in ALERT and Yikatit Medical College Addis Ababa, Ethiopia

Item	Response	Frequency	Percent
Post op complications- Hematoma	No	29	90.6
	Yes	3	9.4
Post op – Infection	No	29	90.6
	Yes	3	9.4
Post op- Dehiscence	No	31	96.9
	Yes	1	3.1

Surgical intervention for Dupuytren's contracture resulted in a significant reduction in the total Southampton score, with a mean difference of 9.2 (95% CI 8.2, 10.2), $p < 0.0001$

Table 4: The effectiveness surgery for improvement of hand function for Dupuytren's contracture in ALERT and Yikatit Medical college, Addis Ababa, Ethiopia 2024

Item	Difference presurgery and post-surgery		P
	Mean difference	SD difference	
Total Southampton score	9.2(8.2, 10.2)	0.5	<0.0001
Q1	2.7(2.4, 2.9)	0.15	<0.0001
Q2	2.4(2.1, 2.7)	0.14	<0.0001
Q3	2.7(2.5, 3.0)	0.12	<0.0001
Q4	1.5(1.2, 1.8)	0.13	<0.0001

CHAPTER SIX: DISCUSSION AND RECOMMENDATION

6.1. Discussion

This study investigated the clinical characteristics, treatment outcomes, and impact on quality of life associated with Dupuytren's contracture (DC) management at a high-volume treatment center in Ethiopia. A male predominance (male: female=15:1) in DC prevalence was observed, consistent with findings from other studies reporting male-to-female ratios ranging from 3:1 to 9.5:1¹². While the precise etiology and mechanisms underlying this sex-based disparity remain unclear, the observed sex variations throughout the disease's clinical course suggest potentially distinct pathophysiological processes. This highlights the need for robust, methodologically rigorous studies, such as clinical trials, to explore sex-specific differences in DC. Evidence indicates that males tend to experience higher recurrence rates, require more surgeries, present with more severe disease, and exhibit an earlier age of onset¹²⁻¹⁴. Although these epidemiological and clinical observations suggest a possible link between gender and disease severity, the underlying pathophysiological mechanisms remain poorly understood. While a genetic component is often cited as a more significant contributor to DC than environmental factors, inconsistencies exist regarding proposed modes of inheritance, such as autosomal dominant transmission with variable penetrance. Future research should employ robust designs to investigate the complex interplay between gender and other known risk factors, such as smoking and diabetes, to fully elucidate the etiological role of sex in this multifactorial condition^{12, 15}.

Descriptive analysis revealed a high prevalence of Dupuytren's contracture (DC) among farmers in this study sample. Although this study did not conduct analytical tests to assess the association between farming and DC, the observed predominance of DC within this occupational group warrants further investigation. The question of whether DC is an occupationally-related disease remains a subject of ongoing debate. While several large epidemiological studies and meta-analyses^{16, 17} have reported a more than twofold increased risk of DC associated with occupational exposure to vibrating tools and heavy manual work (HMW)—attributing this to cumulative microtrauma and impaired hand microcirculation—other studies have failed to demonstrate such an association⁷. A recent analysis of manual laborers in Slovakia, however, found a significant association between DC and exposure to high-vibration tools (HTVs) and HMW, revealing more

than a fourfold increased risk for HTV exposure and a threefold increased risk for HMW exposure compared to controls¹⁸. Notably, the prevalence of DC increased with the duration of exposure to both HTVs and HMW¹⁸.

Surgical intervention remains the gold standard for managing Dupuytren's contracture, aiming to restore hand function and enhance quality of life while maintaining an acceptable complication rate. Patient-reported outcome measures (PROMs) provide a validated means of assessing functional performance and surgical efficacy. The Southampton score is a widely accepted and validated PROM for Dupuytren's contracture. Our study demonstrated a statistically significant reduction in the Southampton score following surgical intervention; the post-operative score was more than nine times lower than the pre-operative score ($p < 0.0001$). This finding highlights the significant positive impact of surgery on patient-reported functional outcomes.

Surgical management of Dupuytren's contracture, while effective, is not without potential complications. This study observed postoperative hematoma and infection in approximately 9.4% of patients, and wound dehiscence in 3.1%. These findings are consistent with existing literature; a network meta-analysis of limited fasciectomy (LF) for Dupuytren's contracture reported complication rates of 4.5% for infection, 3% for nerve injury, and 3.3% for complex regional pain syndrome (CRPS)¹⁹. The observed complication rates highlight the importance of meticulous surgical technique, appropriate patient selection, and comprehensive postoperative care.

6.2. Conclusion

This study reveals a higher prevalence of Dupuytren's contracture among males and farmers, with younger age and a high prevalence of diabetes mellitus (DM) as significant associated comorbidities. Importantly, surgical intervention demonstrated a high degree of effectiveness in improving both hand function and overall quality of life for patients with Dupuytren's contracture.

6.3. Recommendation

For Clinicians:

- Targeted Screening: Given the identified risk factors, clinicians should consider targeted screening for Dupuytren's contracture among male patients, farmers, younger individuals,

and those with DM. Early detection can facilitate timely intervention and improve outcomes.

- **Patient Counseling:** Clinicians should counsel patients regarding the effectiveness of surgical intervention in improving hand function and quality of life, emphasizing the potential for a return to normal activities.
- **Comorbidity Management:** Effective management of associated comorbidities, particularly DM, should be integrated into the overall care plan for patients with Dupuytren's contracture.

For Researchers:

- **Etiological Studies:** Further research is needed to investigate the underlying mechanisms linking age, gender, occupation (farming), and DM to the development of Dupuytren's contracture. This could lead to preventative strategies.
- **Longitudinal Studies:** Longitudinal studies with adequate size are needed to assess long-term surgical outcomes, recurrence rates, and the sustained impact on hand function and quality of life.
- **Comparative Effectiveness Research:** Research comparing the effectiveness of different surgical techniques and non-surgical interventions is warranted to optimize treatment strategies.

For Policy Makers:

- **Occupational Safety:** Strategies to mitigate occupational risks associated with farming and other manual labor that might contribute to Dupuytren's contracture should be explored.
- **Resource Allocation:** Health policy should consider the increased prevalence of Dupuytren's contracture among specific demographic groups and allocate resources accordingly to ensure equitable access to timely diagnosis and effective treatment.
- **Public Awareness Campaigns:** Public awareness campaigns targeted at high-risk groups could be implemented to promote early detection and reduce the long-term impact of this condition.

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