

MANAGEMENT OF FLEXION CONTRACTURE OF HAND: AN EXPERIENCE IN A TERTIARY CARE INSTITUTION

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DOI: [10.5281/zenodo.8374925](https://doi.org/10.5281/zenodo.8374925)

Abstract

The flexion contracture involving the hand arise out of a variety of reasons which can be due to Post burn contractures involving palm or digits; flexion contracture of palm or digits due to Dupuytren's contracture; post traumatic flexion contracture and developmental anomaly of the digits as Camptodactyly. A prospective study was conducted on patients with flexion contractures involving the hand needing correction presenting to OPD of the Post Graduate Department of General Surgery, Government Medical College, Jammu over a period of 12 months w.e.f. 1st November 2021 to 31st October 2022. All the patients were treated as in patients (after admission). The clinic-epidemiological profile of patients was noted and treatment modalities were planned as per the type of deformity. In the Management of Flexion Contracture of Hand, Objective of release was to achieve a functional hand. Stress was laid on post operative splintage and physiotherapy for better functional outcome.

Keywords: Flexion Contracture Hand, Post Burn Contracture, Dupuytren's Contracture, Camptodactyly, Management.

I. INTRODUCTION

Hand is the grasping organ at the end of the forelimb. The hand is exposed to a number of injuries and insults that result in a variety of deformities at times. The flexion contracture involving the hand arise out of a variety of reasons which can be due to Post burn contractures involving palm or digits; flexion contracture of palm or digits due to Dupuytren's contracture; post traumatic flexion contracture and developmental anomaly of the digits as Camptodactyly. Post burn contracture of the hand is one of the most common complications of burns[1]. Post burn contracture of digits can result in flexion contractures, boutonniere deformity, burn syndactyly, metacarpo phalangeal contractures[2]. The mainstay of treatment of post burn hand contracture includes complete surgical excision of the scar tissue and resurfacing of the resultant soft tissue defect, most commonly with full thickness skin grafts. If scar contracture release results in major exposure of tendons or joint distant tissue transfer may be required[3]. Flexion contractures of palm and fingers are usually a result of direct injury to the volar skin from the contact burns most often occurring in children. Linear contractures can create a volar web of skin that attaches the palm to the fingers causing flexion contractures of MP and IP joints of digits. Stern and colleagues[4] classified flexion deformities of PIP joint based on correction of deformity with MP joint flexion.

The Dupuytren's disease involving the palmar and the digital fasciae leads to flexion contracture which is progressive and involves palm and digits especially the ring and little finger of the hand. The deformity arising out of the contracture due to the Dupuytren's disease depends upon the severity of the flexion contracture involving MP joints and IP joints of digits[5]. The surgical treatments for Dupuytren's contracture include fasciotomy consisting of mere sectioning of Dupuytren chords without excision

and fasciectomy consisting of resection of diseased Dupuytren tissue. Extensive or radical fasciectomy consists of excision of apparently normal fasciae with the diseased tissues, so as to prevent the reoccurrence of disease[6].

Camptodactyly is a flexion contracture of the proximal interphalangeal joints and is known as an isolated malformation that affects 1 in 300 in the population and can be inherited as an autosomal dominant trait with variable expression. Camptodactyly has been classified into the three types[7]. The majority of cases (84%) fall into the congenital group. These are noted within the first year of life and occur in boys and girls equally. The non-congenital group patients who manifest after 10 years of age constitute mostly the females[8],[9]. The various treatments for Camptodactyly include splintage of finger in young patients; Z plasty and release of contracture with skin grafts. In some cases the release of the anomalous lumbrical or flexor digitorum superficialis tendon may be needed. Night splints are advised to be worn 3-6 months post operatively for good results.

II. METHODOLOGY

Subjects

A total of 40 patients suffering from flexion contracture of hand due to various causes and admitted to Government Medical College and hospital Jammu were studied prospectively over a period of one year between November 2021 to October 2022. The informed consent was obtained from the patients and the parents of the minors to be included in the study group.

Data Processing

In the hospitalized patients, a detailed history regarding time of onset of contracture, cause of flexion contracture of hand, mode of contracture, time taken for healing of burns of hand causing contracture, any previous treatment received; systemic illness; occupation; alcohol intake, smoking or drug abuse; medication and allergies were noted. The patients were assessed regarding the cause, the duration, severity of the contractures, the progression, cosmetic and the functional disability arising out of the flexion contractures involving the hand. Examination included site of contracture (palm/digits), progression of the contracture and its severity. The severity of the contracture and the soft tissue defect arising out of the release of the contracture was assessed pre-operatively. The treatment modality was planned according to the functional limitation and severity of contracture. A Haemogram, assessment of blood sugar, renal function (blood urea nitrogen and serum creatinine), coagulation profile, blood grouping, HIV, HCV antibodies and serum HBsAg assessment was ordered for in all cases. A chest X-ray and ECG were done as a part of routine pre-operative investigations. All the patients were assessed by the anesthetist for the condition of airway and modality of anesthesia to be used.

Inclusion Criteria:

All the patients presenting to OPD of Government Medical College Jammu with flexion contracture of hand and digits were included in the study.

Exclusion Criteria:

Patients not agreeing to be part of the study and patients having simultaneous contracture involving same wrist were excluded from the study group.

Besides routine preoperative preparation, patients were prepared psychologically explaining them the procedure, the need for use of postoperative splintage for immobilization, the complications that may arise, and the need of physiotherapy. All the patients were operated under general anesthesia. Post operatively, patients were followed for any loss of skin graft/flap necrosis, any infection and donor site morbidity. The sequential follow up at monthly intervals was done to assess the functional and aesthetic improvement post surgically. The patients were stressed upon to use the splint age post operatively for 6 months.

Statistical analysis

Data were entered in Microsoft Excel spreadsheet Version 2013 and analyzed. Data was represented in tables represented below.

III. RESULTS AND DISCUSSION

AGE GROUP(YEARS)	NO OF PATIENTS	PERCENTAGE
0-10	13	32.5%
11-20	6	15%
21-30	10	25%
31-40	3	7.5%
41-50	3	7.5%
51-60	5	12.5%
	Total 40	Total 100%

Out of total of 40 patients, maximum number of patients were in the age group of 0-10 years accounting for 32.5% of the study group. The youngest patient was 6 months old whereas the oldest patient was 60 years old. Mean age of the patients was 23.2 years.

Out of 40 patients in the study, 65% were females and 35% were males with Female: male ratio of 1.8:1. There is a slight female preponderance of post burn contracture due to female group doing most of the household work. 65% of the patients in the study group were dwelling in rural areas where as 35% resided in urban areas.

Distribution According To Number Of Digits Involved

NO. OF DIGIT INVOLVED	NO. OF PATIENTS	PERCENTAGE
One digit	16	40%
Two digits	20	50%
Three digits	3	7.5%
More than three digits	1	2.5%
	Total 40	Total 100%

In 50% of the cases, flexion contracture involved two digits while 40% of the patients presented with flexion contracture involving one digit only.

Distribution According To Cause Of Contracture

CAUSE OF CONTRACTURE	NO. OF PATIENTS	PERCENTAGE
Post burn	23	57.5%
Post traumatic	6	15%
Dupuytren's contracture	6	15%
Camptodactyly	5	12.5%
	Total 40	Total 100%

Post burn contracture was the commonest cause of flexion contracture presenting in 57.5% of the study group(n=40).Post traumatic contracture and Dupuytren's contracture accounted for 15% cases each .Right hand was involved in 40% of the patients whereas involvement of left hand was observed in 60% of the patients.

Distribution According To Surgeries Done For Contracture Release

TYPE OF SURGERY	NO. OF PATIENTS	PERCENTAGE
Contracture release with STSG with immobilization	22	55%
Contracture release with K wire fixation with STSG with immobilization	6	15%
Contracture release with FTSG with immobilization	3	7.5%
Contracture release with excision of fibrous band with immobilization	6	15%
Contracture release with Z plasty with immobilization	3	7.5%
Total	40	100%

In 55% of the patients, the modality of treatment was Contracture release with STSG with immobilization. Contracture release with K wire fixation and STSG, FTSG, Excision of fibrous band and Z plasty was done in 15%, 7.5%, 15% and 7.5% respective A total of 4 patients out of 40 developed postoperative complications, out of which 2 patients had partial graft loss, which was managed by regular antiseptic dressings and 2 patients had a residual contracture for which staged procedure for release was planned. 65% of the patients had excellent functional outcome whereas 30% of the cases reported good functional outcome. 5% of the cases reported fair outcome. These results were graded as excellent/good/fair depending upon the release of contracture and the absence or presence of any complications post operatively. Patients having no residual contracture and no post operative complications were graded as excellent.

The flexion contracture involving the hand arise out of a variety of reasons which can be due to Post burn contractures involving palm or digits; flexion contracture of palm or digits due to Dupuytren's contracture; post traumatic flexion contracture and developmental anomaly of the digits as Camptodactyly. In our study,40 patients presenting with flexion contracture involving hand and requiring contracture release for functional and aesthetic restoration was undertaken over a period of one year w.e.f1stNovember, 2021 to 31stOctober 2022.

Age of patients varied from 1.5 years to 55 years. Maximum number of patients belonged to the age group between 0-10 years (33%). The mean age of the patients was 23.2 years. Different authors have observed similar age group being affected with flexion contractures of hands[4,10].In our study, females were affected more than males. Females contributed for 65% of the study group whereas males accounted for

35% of the patients. Our study goes well with study of other authors[11],[12].In our study, Left hand was involved in 58% of the patients while Right hand accounted for 42% of the patients. Involvement of right hand in most cases has been reported by other authors[11],[14]. In our study on 40 patients presenting with flexion contractures of digits, most common cause of flexion contracture of fingers was Post burn contracture accounting for 57% of the cases followed by Post traumatic and Dupuytren's contracture in 15% each. Camptodactyly was observed in 13% of the cases. Various causes for flexion contracture of digits has been put forward in other study[14]. In our study, Single digit was involved in 40% of cases whereas 2 digits were involved in 50% of cases. Our study goes well with other studies[15].

In our study on 40 patients presenting with flexion contracture of digits, the most common surgical method used for managing the flexion contracture was Contracture release with STSG with immobilisation (53%), followed by Contracture release with K Wire insertion with STSG with immobilisation (15%). Various authors have resorted to different methods of operative treatments for flexion contractures involving hand[11],[16].In our study on 40 patients presenting with flexion contracture of hand, 4 patients(10%) had post operative complications; 2 patients (5%) had partial graft loss and 2 patients (5%) had residual contractures. Complications involving treatment of flexion contractures of hand have been enumerated by different authors[11],[14]. Functional Outcome was Excellent in 65% cases, Fair in 30% patients whereas 5% patients had Good functional outcome post operatively in our study.

IV. CONCLUSION

In the Management of Flexion Contracture of Hand, Objective of release was to achieve a functional hand. Stress was laid on post operative splintage and physiotherapy for better functional outcome. The counselling of the patients in the pre and post operative period is a must to stress upon the patients to wear the splint for 6 weeks during day and night and at night only for the subsequent 6 weeks with massage with coconut oil periodically to maintain the results achieved out of the surgical intervention.

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Pre-operative photograph of Camptodactyly of Left Hand



Post-operative photograph of Camptodactyly flexion contracture release.



Pre-operative photograph showing Dupuytren's flexion contracture of Ring finger of Left Hand.



Post-operative photograph after excision of fibrous contracture band.