



Study of Reconstructive Surgeries in Leprosy

Dr. Jayesh Sachde, Dr. Dhaval Vanzara, Dr. Sudarshan Gothwal, Dr. Ronak Kadia*, Dr. Piyush Malav, Dr. Manav suri

(Professor and Head, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

(3rd year resident, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

(3rd year resident, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

(3rd year resident, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

(2nd year resident, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

(Professor, Dept of Burns and Plastic surgery, Civil hospital, Ahmedabad.)

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ABSTRACT

INTRODUCTION

Leprosy is not only a communicable disease but also a disabling one because of deformities. The externally obvious deformities cause a marked handicap in social life apart from their disabling aspect to the individual. Most of the deformities in leprosy can be prevented and those, which cannot be prevented, can be corrected by reconstructive surgery. Various reconstructive surgeries have changed the course of evolution in the handicapped society of leprosy. By reconstructive surgeries we do not cure leprosy or decrease its prevalence rate but definitely we can improve the routine life of the affected person who will then not be dependent for his bread and butter, thereby we can reduce the burden to the society. This is true rehabilitation. Increase in social acceptance will decrease horror of the disease and society will take it as a disease rather than a stigma.

AIM

The present study was undertaken to know the magnitude of the problems and to evaluate different factors that can influence the development of deformities of limbs.

MATERIALS AND METHODS:

This prospective study was carried out in the Department of Burns and Plastic Surgery, Civil Hospital, Ahmedabad. The study was carried out over 50 patients in a defined time period of twenty-four months commencing from May 2021 to May 2023.

RESULTS

Overall results of surgery is very much dependent on postoperative physiotherapy. it requires patient's compliance. Postoperative physiotherapy should also do under supervision, which is not possible in patient who resides at remote places.

CONCLUSION

In general, various reconstructive surgeries for claw hand and foot drop in leprosy patient is very much helpful for improvement in functional level of hand and thereby improving individual's quality of life. in term, this is really a true 'rehabilitation'.

Keywords: Reconstructive surgeries, leprosy, deformity.

I. INTRODUCTION

Leprosy is not only a communicable disease but also a disabling one because of deformities. The externally obvious deformities cause a marked handicap in social life apart from their disabling aspect to the individual. This applies to all the deformities irrespective of their cause. In leprosy the situation is further complicated by the general ignorance, prejudice, fear and social stigma attached to it. Leprosy is unique in its peculiarly intense reaction. It is unique in the complex of its identity and pathology.

Deformity is not only an increasing burden in the society, by reducing the patient's capacity for work but is also responsible for the dread and fear with which the disease is still regarded. Handicapped leprosy patient in the absence of any other occupation become medic ants as is seen in some South East Asian countries. Their growing numbers do represent a loss to the community in terms of productive labors. Loss of manpower does hamper the rise of economic level, Standard of living and education of the community.

Deformities and disabilities in leprosy patients are not an inevitable and inescapable feature of leprosy except for a few deformities such as collapse of the nose or loss of the eyebrows in untreated advanced Lepromatous Leprosy. The majority of deformities are attributed to peripheral nerve damage. Early diagnosis, regular and adequate treatment and early recognition of



decreasing nerve function are of utmost importance to prevent and reverse the nerve damage. Perhaps in no other disease are the rewards of early diagnosis so rich and perhaps in no other disease are the penalties of neglect so terrible.

Most of the deformities in leprosy can be prevented and those, which cannot be prevented, can be corrected by reconstructive surgery. Prevention is not only better than correction but also within the reach of every leprosy worker and paramedical workers with the minimum of training and inexpensive equipment. A lot is achieved when curing a leprosy patient but by preventing deformity we do prevent the loss of man's self-respect and dignity.

Various reconstructive surgeries have changed the course of evolution in the handicapped society of leprosy. By reconstructive surgeries we decrease its prevalence rate but definitely we can improve the routine life of the affected person who will then not be dependent for his bread and butter, thereby we can reduce the burden to the society. This is true rehabilitation. Increase in social acceptance will decrease horror of the disease and society will take it as a disease rather than a stigma.

II. METHODS

This prospective study was carried out in the Department of Burns and Plastic Surgery, Civil Hospital, Ahmedabad. The study was carried out over 50 patients in a defined time period of twenty-

I. Age Distribution of Hand Deformity

Table 1

| Age group | 0-10 | 11-20 | 21-30 | 31-40 | 41-51 | 51-60 | 61-70 |
|-----------|------|-------|-------|-------|-------|-------|-------|
| No of pts | 0 | 7 | 8 | 10 | 12 | 10 | 3 |

In this study no cases were found in the 0-10 age group. Maximum number of hand deformities were found in 30-50 years age group.

Low incidence of deformities in children is due to milder form of disease is more prevalent in children, shorter duration of disease in children,

four months commencing from May 2021 to May 2023.

Selection Criteria for the Patient:

• Inclusion criteria

1. The deformity should be either stabilized or fully developed.
2. Health of overlying skin is vital, as wound dermatitis or skin reactions are contraindications for surgery.
3. Normal range of passive joint motion is required for most successful results from tendon transfers. Rigid joints mean poor operative results.

• Exclusion criteria

1. Patient not willing for surgery
2. Gross infection
3. General condition poor, not fit for surgery

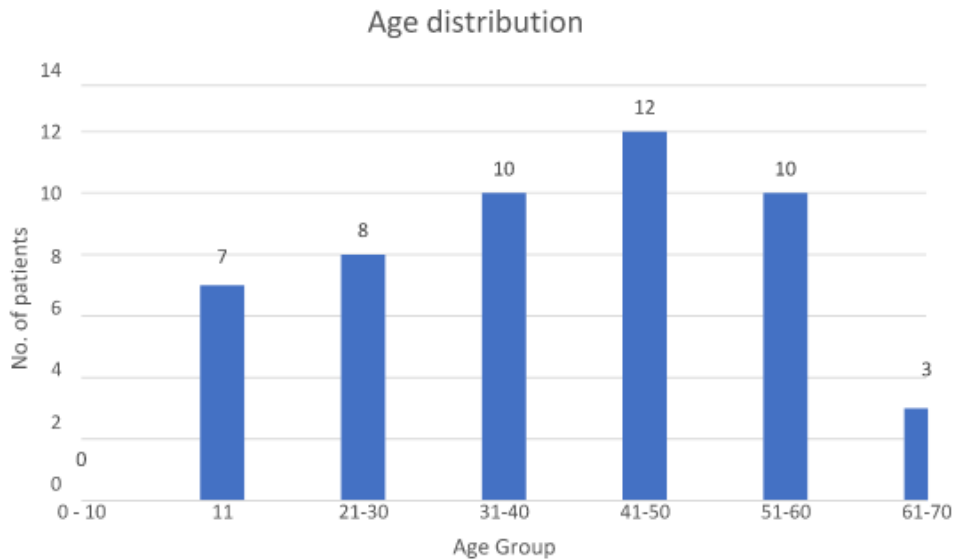
Pre-operative Evaluation also includes:

1. Routine pre-operative investigations.
2. Preoperative physiotherapy
3. Improvement of local condition by application of emollient/coconut oil.

III. RESULTS

A study of 50 cases of hand deformities in leprosy was carried out. Their age incidence, sex incidence, clinical features and other findings were analyzed and were compared with similar other studies.

increased tendency towards self-healing and low incidence of reactive episodes. In addition to these factors, the cumulative effect of permanent deformity leads to high deformity rate observed in adults.



II. Sex Distribution of Deformity

Table: 2

| Disease | Number | Percentage |
|---------|--------|------------|
| Male | 38 | 76% |
| Female | 12 | 24% |

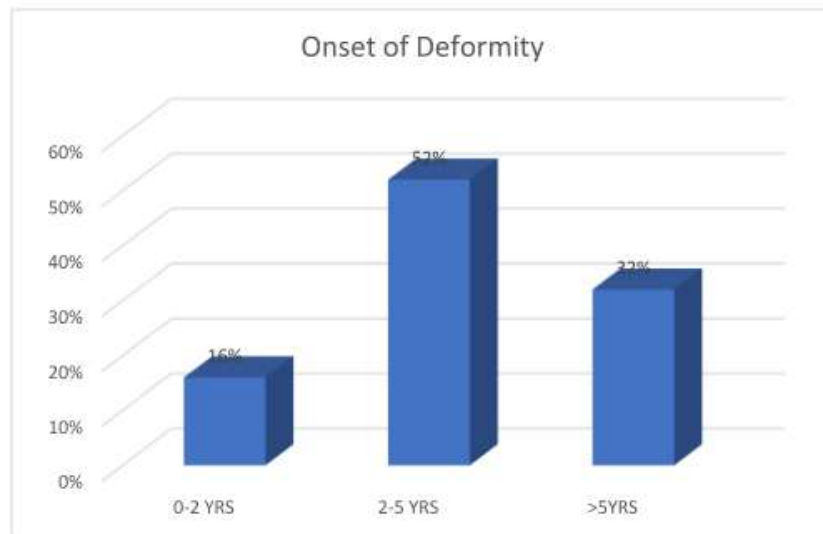
In this study, deformities of hand were more common in males than female. In present study, ratio of male to female affected is about 3:1.

High incidence of deformities in male is most likely due to environmental factors. Males by virtue of their occupation are engaged in rougher manual work, outdoor habits and smoking are likely to be resulting in the deformities.

III. Onset Of Deformity

Table: 3

| AGE GROUP | NO OF PATIENTS |
|-----------|----------------|
| 0-2 YRS | 8 (16%) |
| 2-5 YRS | 26 (52%) |
| >5YRS | 16 (32%) |



In 52% of the cases deformity occurred between 2-5 years of age. In 32 %, it occurred after more than 5 years and in 16 %, it occurred before two years of age.

This means that the onset of deformity could be up to four times longer among the lepromatous than among tuberculoid, whereas deformity seems to be an earlier manifestation

among the tuberculoid than among the borderline patient.

Occurrence of deformity depend on involvement of nerve, for tuberculoid leprosy nerve involvement is earlier whereas in lepromatous leprosy due to slow progress of disease, nerve involvement occurs in the late stage.

IV: Pattern of Deformity

Table: 4

| PATTERN OF DEFORMITY | NO OF PATIENTS |
|----------------------|----------------|
| Ulnar claw | 19 (38%) |
| Median claw | 0 |
| Combined claw | 31 (62%) |

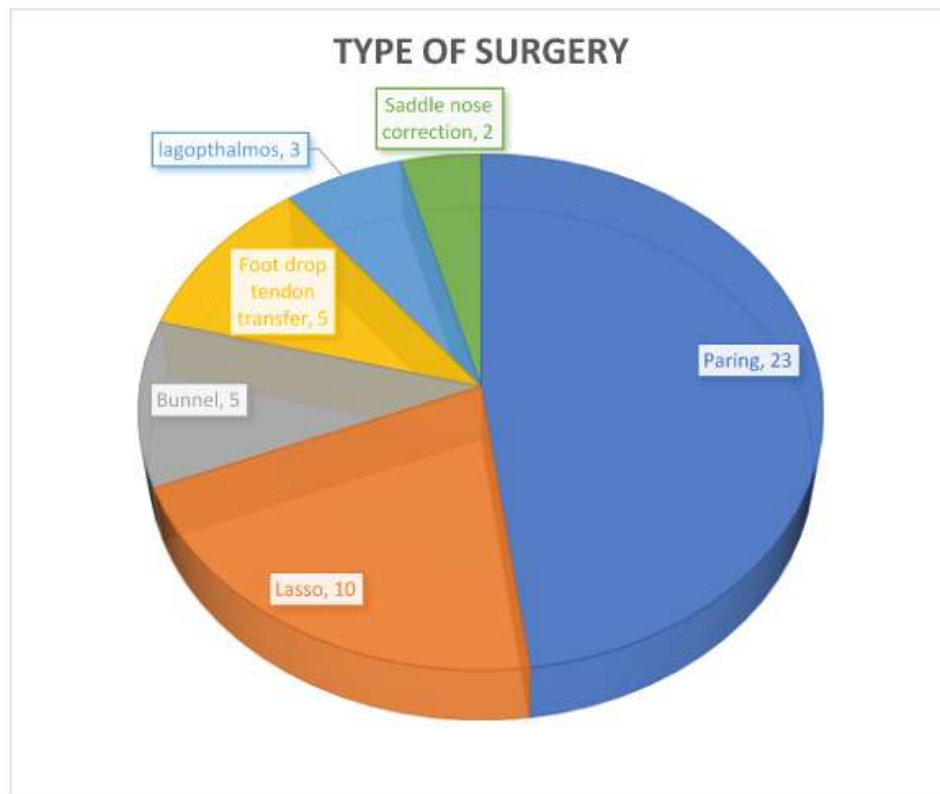
Ulnar nerve is the commonest nerve involved in the leprosy. Median and radial nerve paralysis is nearly always associated with or

followed by ulnar nerve palsy. Therefore, isolated median nerve or radial nerve paralysis is rarely seen.

V. Type of surgery

Table 5:

| Sr No | Type of surgery | No |
|-------|---------------------------|----|
| 1 | Plantar ulcer | 23 |
| 2 | Claw hand | 17 |
| | Lasso | 12 |
| | Bunnel | 5 |
| 3 | Foot drop tendon transfer | 5 |
| 4 | lagophthalmos | 3 |
| 5 | Saddle nose correction | 2 |
| | Total | 50 |



Whenever there is a combined type of deformity due to involvement of median nerve thumb deformity is also present. In such cases without correction of thumb deformity good results are not obtained. So opponensplasty was also done as an extra procedure which was added to the combined type of deformity. So in total 3 patients opponensplasty was added to other dynamic procedure.

Here out of 17 dynamic procedure 12 patients had undergone LASSO procedure and 5 patients had undergone Bunnel's procedure. LASSO procedure is maximally advocated here, because it is easy to perform and most importantly do not require special training for the surgeon. Technically they are very easy to perform and gives good results. They can be performed in less time and are equally cost effective.

Here we had done paring in 23-foot ulcers. Paring is surgical procedure to excise margin of ulcer, that will convert non healing ulcer to healing ulcer. After adequate debridement of dead necrotic tissue dressing done. Plaster splint is given. Advice given for local hygiene. Where feasible the scar is excised, the wound edges are undermined and the wound is closed by direct suturing. If possible, a subcutaneous fat flap may be interposed between the scar and the deeper tissues in order to improve the shock-absorbing quality of the weight-bearing

site. When closure by excision and re-suture is not feasible, skin grafting may be done to cover the raw area. Depending on the local condition, we may use split-thickness or full-thickness skin graft. The dorsum of the foot is a good donor site for full-thickness skin graft in the sole of the foot.

We have total 5 patients with foot drop post leprosy diagnosis. All 5 patient underwent tendon transfer as dynamic procedure for foot drop. Tibialis posterior tendon was transferred to EHL and EDC. Which is simple procedure with prompt good results. Patient can walk post operatively without any special shoes.

We had 3 patients with lagophthalmos, which were corrected by TFL graft placement above tarsal palate. Another patient managed only with temporary tarsorrhaphy procedure. Post operative patient managed with night time eye tape and eye drops. On long term no complications were found.

Nasal deformity is unique problem with leprosy, we had 2 patient with nasal deformity. One patient had exposed nasal bone over dorsum of nose. Debridement of exposed bone and primary suturing was done. Another patient had saddle nose deformity, managed by nasolabial turn over flap to elevate depressed nose by adding some volume to dorsum of nose. Post operative no such complication has been found.



COMPARING VARIOUS SURGERY FOR CLAW HAND:

Out of the total of 50 patients in whom reconstructive surgeries were performed, out of that 17 had claw hands, 12 patients operated by lasso

procedure and 5 patients were operated by Bunnel procedure.

As Shown in the table we can get a glimpse of the various dynamic procedures performed and their results as discussed earlier.

| | Lasso | Bunnel | Total | % |
|------|-------|--------|-------|-------|
| Good | 11 | 4 | 15 | 88.23 |
| Fair | 1 | 1 | 2 | 11.76 |
| Poor | 0 | 0 | 0 | 0 |

These results indicate that combining both types of dynamic procedures. A total of 15 patients accounting to 88.23% had good results, 2 of them had fair results accounting to 11.76%. None had poor result.

The above results are evidence to the fact that good results are obtained more in dynamic than in static. As such, this comparison is not valid because selection of patient in both the groups is different.

FOOT DROP TENDON TRANSFER(N=5):

Out of total 50 patients of leprosy there are 5 patients with foot drop due to leprosy. There are also various other reasons for foot drop but here we take only post leprosy foot drop only. We had done tibialis posterior to EHL and EDC tendon.

a. Evaluation of tendon transfer result

| Active ROM at dorsiflexion | No of patients |
|----------------------------|----------------|
| 0 degree or more | 3 |
| -10 degree to 0 degree | 2 |
| -20 degree to -10 degree | 0 |

b. Evaluation of gait

| Gait assessment | No of patients |
|-----------------------------------|----------------|
| Walks normally | 3 |
| Walks with difference in two feet | 2 |
| Walks with dragging of foot | 0 |

c. Average results. (n=14)

| Grade | No of patients |
|-------|----------------|
| Good | 3 |
| Fair | 2 |
| Poor | 0 |



• **LAGOPHTHALMOS. (n=3)**

There are 3 patients with lagophthalmos were operated by various methods. 1 patient was operated by temporary tarsorrhaphy method and patient kept with tarsorrhaphy for 21 days. And later on, it was removed. Patient was improved with good results.

Another 2 patients with moderate lagophthalmos were operated by TFL graft placement over tarsal plate of upper eyelid, which will act as weight. Post operative patient had given temporary tarsorrhaphy for 21 days. Patient had given ophthalmic eye drops till this duration. After 21 days tarsorrhaphy was removed. Post operative no complication has been noted.

No series is available for comparison of results with our present study.

• **SADDLE NOSE CORRECTION (n=2)**

There are only 2 patients with saddle nose deformity. 1 male patient had exposed nasal bone with was dead and necrotic. Adequate debridement has been done followed by primary closure of wound has been done over dorsum of nose.

One female patient had saddle nose deformity with previous history of incision and drainage was done previously. Patient was operated by nasolabial flap turn over flap for dorsum of nose augmentation. Post operative flap was settled and small margin was necrosed which was managed by dressings only. Patient post operative improved clinically and satisfied with dorsal augmentation of nose in leprosy.

No series is available for comparison of results with our present study.

IV. CONCLUSION

Conclusions of my study as are following –

1. Maximum number of cases of hand deformity are found in the age group of 30 - 50 years. No case was found in the 0 - 10 years age group.
2. Deformities are more common in males than in females.
3. In more than half of the total patients, the onset of deformity was between 2 - 5 years and in the remaining half, two-thirds had the onset after 5 years of disease and only one-third have the onset of deformity before two years.
4. Combined claw hand was found in maximum number of patients of this study. While isolate ulnar claw hand was found in one-third cases. No case of isolated median or radial nerve involvement was found.

5. In this study it was found longer the duration of disease more severe the deformity and poorer were the result of surgery.
6. Dynamic procedures give definitely better results than static procedures. LASSO proves to be most effective means of dynamic procedure for mobile claw hand. And same with tendon transfer in foot drop.
7. Preoperative selection of patient is most important for deciding which type of surgery should done. Otherwise results obtained will be poor.
8. Without preoperative as well as postoperative physiotherapy complete results cannot be obtained. So, this is one of the most important consideration in planning surgery.
9. Surgery over isolated ulnar claw hand gives better result than combined claw hand deformity.
10. No major complication was observed except minor wound infection.

But for evaluation of durability of these various reconstructive procedures and their complication, long term follow up is required.

In general, various reconstructive surgeries for claw hand and foot drop in leprosy patient is very much helpful for improvement in functional level of hand and thereby improving individual 's quality of life. in term, this is really a true 'rehabilitation'.

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