Comprehensive Perspectives on Reconstructive Surgery in Leprosy: From Clinician & Patient centered Dimensions

re·con·struc·tion = the act or process of rebuilding, repairing, or restoring something

Merriam-Webster

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In the Presentation:

1. Conditions that requires RCS
2. Aim/Goals/Purpose of doing RCS
3. What are patients' expectations
4. Criteria of referral for RCS
5. Types of RCS
6. Post operative Physiotherapy
7. Post operative RCS Complications
8. Limitations of RCS
9. Post RCS Advise/ Counselling
10. Patients perspective towards RCS
11. Programme perspective – need for change

Conditions that require Surgical Interventions

- Claw Hand: Ulnar / Median Nerve Paralysis
- Foot Drop: Lateral Popliteal Nerve Paralysis
- Claw Toes: Posterior Tibial Nerve Paralysis
- Lagopthalmos: Facial nerve Paralysis
- Wrist Drop: Radial nerve Paralysis
- Saddle Nose: Facial nerve Paralysis

etc.... Madarosis, Thickening of earlobes, Deviation of mouth, Gynecomastia, Claw toes, Ulceration of hands and feet, Loss of toes and metatarsals and loss of fingers, Short foot and mitten hand, Disintegrated tarsal bones, Disintegrated carpal bones.

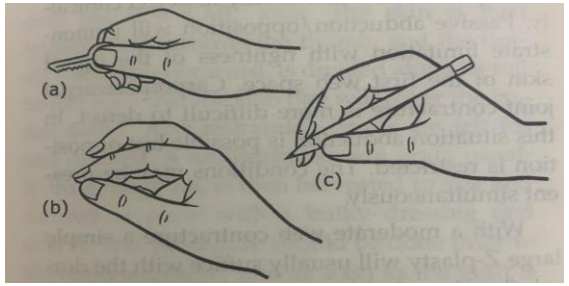
Aim for doing Reconstructive Surgery

- Restoration of functional ability
- Cosmetic improvement (better appearance)
- Social acceptance
- Improve economical status
- Prevention of secondary impairments

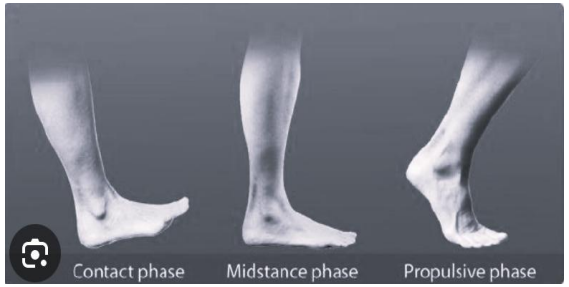
Goal / Purpose for doing RCS

- **Ulnar Nerve Palsy:** To restore function and appearance of the hand to its fullest potential. With an 'open' hand the fingers are straight; during closing of hand there is a proper sequence of flexion of the finger joints, this is achieved by restoring primary flexion in MCP joint.

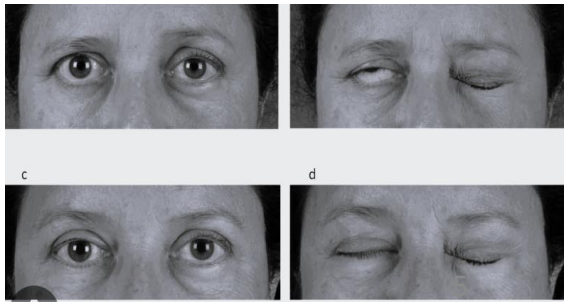
- **Median Nerve Palsy:** Presence of a thumb, which can be able to oppose against the other digits in a 'pinch grip'. Two basic types of functional pinch are described- the key pinch and the pulp-to-pulp pinch.



- **Foot Drop:** The leg should obtain active dorsiflexion of the foot and restore normal walking gait pattern (heel-to-toe) as much as possible.



- **Lagopthalmos:** To achieve narrowing of the widened palpebral fissure, providing voluntary closing and opening of the eye and should be cosmetically acceptable.



What are Patient's expectations!!!

- It is important that the patients knows and understands what the surgery/operation and postoperative rehabilitation is all about.

- This will ensure postoperative compliance and good results with the surgery/physiotherapy.

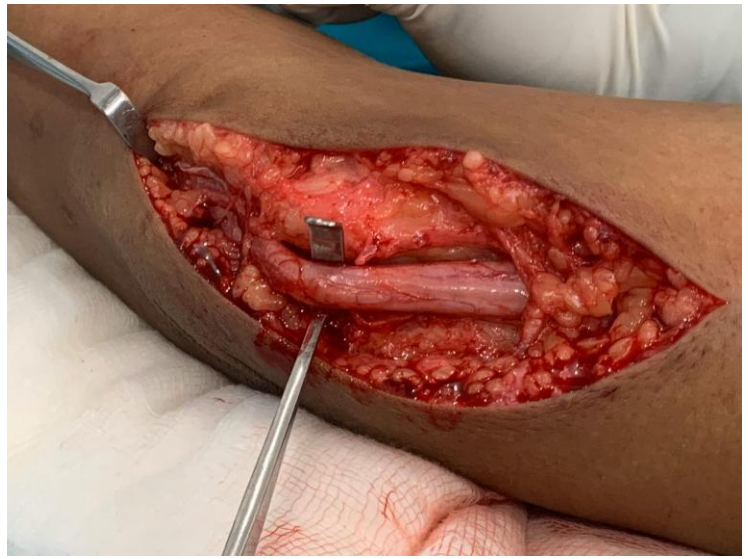
- A useful question to ask the patient before operation is :

  "What do you expect from the surgery"?

- And an important answer to the patient by the clinicians :

  "RCS will restore cosmetic appearance and functional capabilities"

When to do Surgery



- Urgent : Nerve De-compression, Neuropathy, Abscess, Necrosis
- Planned: Reconstructive surgery
- Precautions: Successful outcome depends on-
  - ✓ Pre- and Post-operative physiotherapy
  - ✓ Ability of patient to forget and learn to use new abilities/movements
- Physiotherapy: – Fundamental necessity
  - ✓ Good Surgery + Poor Physio → Poor Results
  - ✓ Not a good Surgery + Good Physio → Good Results

Criteria for Referral for RCS

- Social
- Motivational
- Physical
- Deformity
- Leprosy Treatment

Social Criteria

- Patient who will benefit socially, occupationally and economically.
- It should have the potential to make a difference to patient for acceptance into society and family.
- Patient and his family should be well informed about outcome, and any possible change in his occupation or daily living.
- Potential to improve their socio-economic situation.

Motivation

- Patient should have a good reason for co-operation with the long treatment necessary and be going to make use of the operation.
- Patient must be self motivated and should have strong reason for change. e.g., family to get back to, a prospective job, a marriage proposal, etc.
- Patient should have a good understanding and support from the family members.
- There should be absolute consensus among patient and health care worker during referral for RCS.

Physical Criteria

Age:

- 12 - 40 years (can be relaxed depending on situation) for Hand surgery.
- 12 – 60 years (can be relaxed depending on situation) for Foot surgery.
- No age limit for Eye surgery.

Intelligence:

- Patient should be fairly intelligent, co-operative and able to follow instructions (unlearn to learn) though he need not be educated.

General Health:

- Suppleness of the joints.
- Good general health: No any concurrent diseases should be stabilized.

  (e.g., hypertension, diabetes, anaemia, etc.) – under medical cover

Deformity Criteria

Duration:

- Duration of muscle paralysis – should be at least 6 months to one year usually, and preferably not longer that 3 years, so that there is no chance of nerve recovery making surgery unnecessary.

Secondary impairments:

- Should be absent or less. i.e., joints should be mobile, skin free from scars, absorption, ulcers, etc.
- Severe contractures or stiff joints are not suitable, although physiotherapy/ surgery can reverse some contractures.
- No infection of the skin such as scabies, deep cracks, wounds or ulcers at time of referral.

Leprosy Treatment Criteria

Leprosy Treatment (MDT):

- A minimum of 6 months to 1-year regular anti leprosy treatment (MDT) is preferred before surgery. In this time patient has learnt about leprosy and its treatment and care of anesthesia.

Bacteriological Index (BI):

- Preferably BI should be negative or nearly negative.

Reaction/Neuritis:

- Should be free from reactions (Type I or Type II) and free from symptomatic neuritis for at least 6 months.
- Should not have / had Lepra reaction during the past 6 months unless the surgery is for neuritis. The stress of surgery may cause further reaction and complications.
- No tenderness of any major nerve trunk in the limbs.

Types of Reconstruction Surgery....

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In Face:

- Lagophthalmos – Tarsorrhaphy or Canthoplasty (Lid gap <6 mm), TMT (Lid gap >10 mm), Madarosis, etc.
- Nose Collapse - Bone Graft, Thickening of earlobes.
- Facial Correction - Facial sling, Face lift, Deviation of mouth.

Lagopthalmos Correction

Name: Sanjay Baitha
Age/sex: 31 /M

Dx: Lt eye Lagophthalmos

Lagopthalmos Correction

Name: Neetu Kumari
Age/ Sex: 19 / F
Dx: Rt eye Lagophthalmos
RCS: TMT

Types of Reconstruction Surgery.....

In Hand:

- Tenodesis – Static (Tendon-to-Tendon: Lasso)
- Arthrodesis – Permanent (Wrist-Triple nerve Palsy)
- Tendon Transfer - Dynamic (TMT for radial palsy)
- Deformity Correction - Stiff joints, Soft tissue contractures and Bent bones

Ulnar Nerve Claw Correction

Name:	Mamita Kumari
Age/ Gender:	17 / F
Impairment:	Lt Hand Ulnar claw
RCS:	Lasso

Ulnar Nerve Claw Correction

Name:	Parmanand Sardar
Age/ Gender:	24 / M
Impairment:	Rt Hand Ulnar claw
RCS:	Lasso

Median Nerve Claw Correction

Name: Rajnish Ram
Age/ Sex: 26/ M
Impairment: Lt Median Claw
RCS: Ape thumb correction

Median Nerve Claw Correction

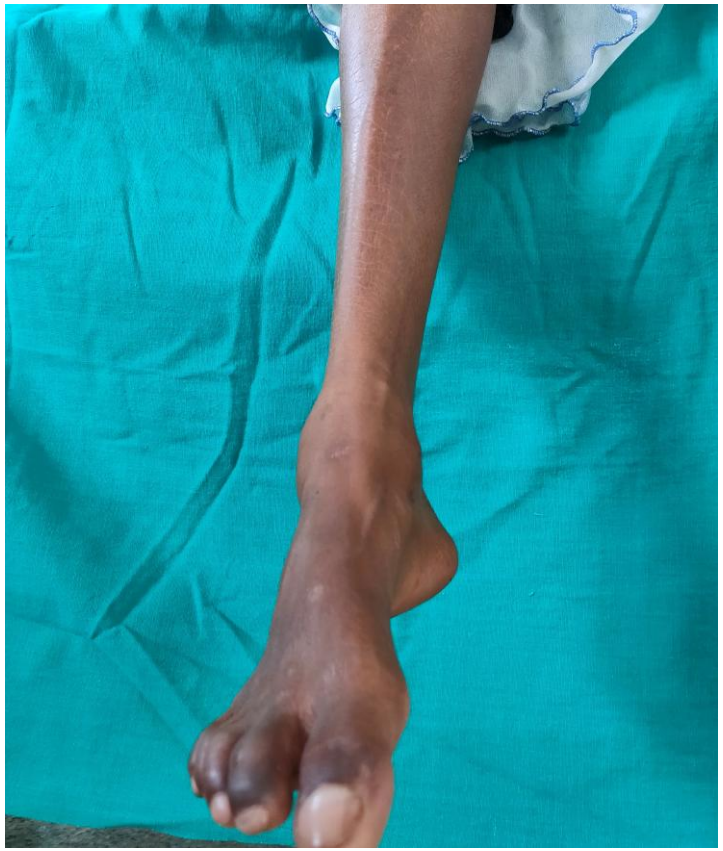
Name:	Pradum Kumar Ganesh
Age/ Sex:	20/ M
Dx:	Lt Ape thumb
Sx:	Lt Opponensplasty

Types of Reconstruction Surgery…

In Foot:

- Tenodesis - Tendon-Bone: Foot Drop Correction
- Arthrodesis - Ankle-Unstable Joint
- Tendon transfer - PT> ECRB for wrist extension, FCR>EDC for finger extension, PL> EPL to restore thumb extension, TP Transfer, F to E tendon transfer (Flexor to Extensor tendon to restore lost function).
- Flap – Local, Distant
- Amputation – Forefoot, Boyd, Syme's, BK, AK

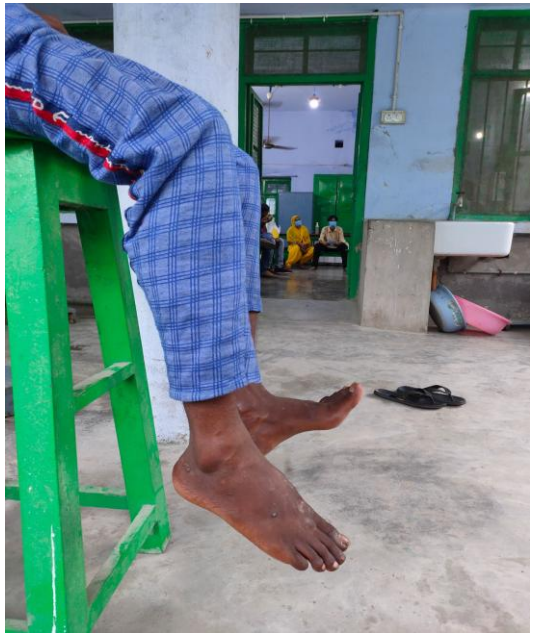
Foot drop Correction



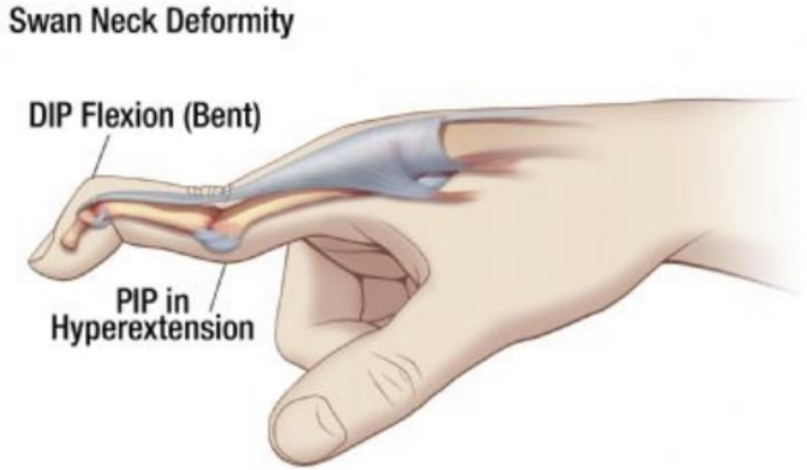
Name:	Sapna Kumari
Age/ Gender:	22 / F
Impairment:	Rt foot drop
N.O.S:	TPT + LTA

Foot drop Correction

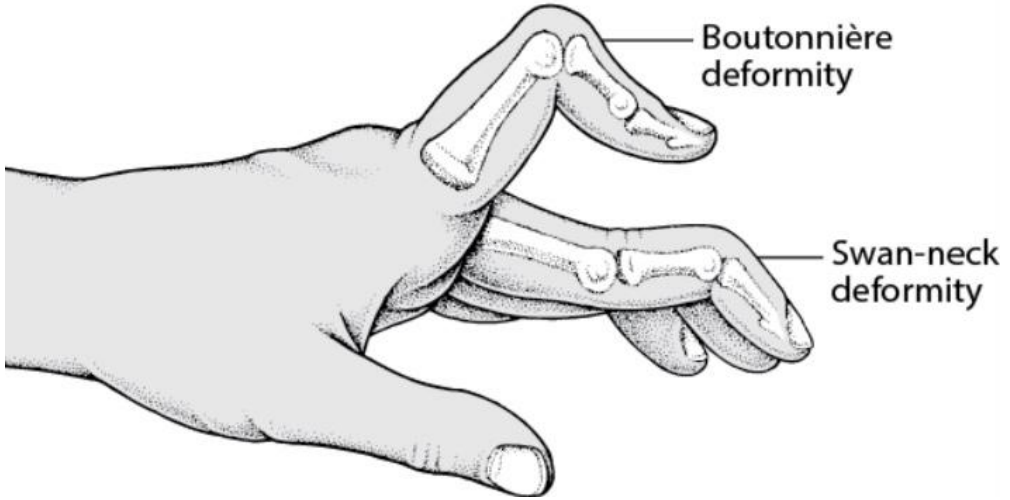
Name:	Bablu Kumar
Age/ Sex:	25/ M
Dx:	Rt foot drop
Sx:	Rt TPT



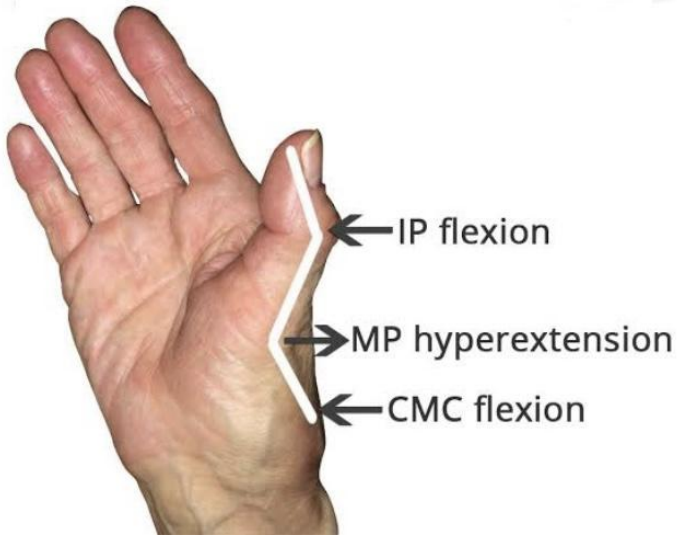
Early Post operative Complications



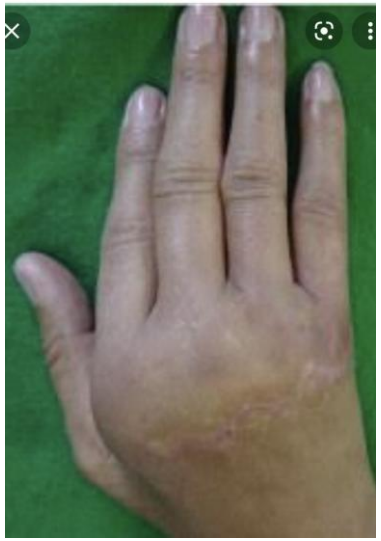
Swan neck deformity



Boutonniere/Hooding deformity



'Z' Thumb deformity



Ulnar deviation of fingers

Post-Operative Physiotherapy

1st week: Isolation	2nd week: Strengthening	3rd week: Co-ordination	4th week: Function
• Isolation of transferred muscle. • Prevention of damage or misuse of transferred muscle. • Prevent/control swelling. • Improve skin condition.	• Strengthening of transferred muscle. • Progressive exercises- Action against gravity.	• Improve coordination of the transferred muscle. • Teaching to work together with other fingers.	• Training for functional use of transferred muscle.

Limitations of RCS

- Sensory loss is not restored, Anesthesia persists.
- Some loss of power of muscles on transfer.
- One muscle being used to replicate function of several other.
- Previous contractures affects results.
- Too many procedures at a time affects results.
- Age/Intelligence/Compliance of patients matters.
- Atrophy of the muscles remains.

Post RCS Advise/ Counselling

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Hand

- Avoid lifting of heavy objects, at least up to 6 months.
- Exposure to hot materials during daily activities.

Foot

- Avoid walking or standing for a long time.
- Avoid working in muddy/wet fields, for at least 6 months.
- Avoid sitting cross legged on floor.
- Avoid walking bare foot.

Eye

- Avoid long exposure to bright light.
- Should wear goggles during daytime.
- Should take lifelong care of eyes, even after operation.

Patients perspective towards RCS

- Long duration of hospitalization (1-2 weeks of Pre-operative physiotherapy + Surgery (3 weeks with POP cast) + 4 weeks of Post-operative physiotherapy = 8-9 weeks.
- Distance of RCS centre from home = 100-500 kms.
- Travel expenditure to travel to RCS centres (about 3-5k per trip).
- Companion along with patient (female patients) during long stay at hospital (extra expenses).
- Loss of wages/break in work for long duration (difficult for sole earner in the family).
- Farming season – cannot take a long break from farming, as they miss farming schedule.
- Festivals/marriages/competitive examinations/family functions/deaths in family – are the major reasons for avoiding surgeries.

Programme perspective – need for change

- Counselling of every NEW patient about complications of the disease (reactions, neuritis, primary and secondary impairments).
- Line listing of G2D cases at the block/district and state level (at least from last 5 years).
- Establish and strengthen referral system (know how of RCS centres in region/state to health care workers & patients).
- Timely availability and disbursement of funds towards RCS incentives to patients.
- According to NLEP Report 2024-25 about 75% of RCS are being conducted at NGO institutions than in Government hospitals.
- Funding for such NGO institutions can be considered to motivate and cover the backlog cases (mainly in high endemic states like Bihar, Jharkhand, Uttar Pradesh, etc.)
- The major hurdle in setting up RCS centres is availability of Physio unit in the state, though with limited RCS surgeons in the country, availability of surgeons is not major issue than the physio unit.
- Regular conduction of RCS camps in high endemic states to be encouraged than clearing of backlog cases.
- Remuneration for surgeons'/physiotherapists to be considered for motivation.
- Backlog of RCS eligible cases will always remain (considering the constraints from patients perspectives).

RCS camps at different hospitals

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Thank You

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