

made between sensory impairment and hypopigmentation⁽⁸⁾. The role of cellular infiltrates in hypopigmentation⁽²⁾ has been refuted⁽⁴⁾. Reduction of the melanocyte population, alteration of the morphology of melanocytes, and melanotic-to-amelanotic melanocyte ratio have been reported⁽⁴⁾. Hypertrophy of melanocytes in hypopigmented lesions has in some cases been attributed to melanin block⁽⁵⁾. Central pigmentation of a hypopigmented lesion following topical psoralen has been recorded⁽⁴⁾. PUVA (psoralen plus ultraviolet A rays), an accepted mode of therapy in vitiligo, leads to hyperpigmentation which persists longer than hyperpigmentation due to suntan⁽⁶⁾. PUVASOL (psoralen plus ultraviolet A rays from the sun) may be used in repigmentation of lesions from the initial stage itself, especially if the lesions are situated in exposed parts of the body or are cosmetically embarrassing. The mode of action of PUVA in repigmentation of tubercloid lesions is to be determined.

—Chakravarthi R. Srinivas, M.D.

*Assistant Professor
and In Charge*

—Rayadurga P. C. Naik, M.D.

Professor

—Devasthanam S. R. Krupashankar,
M.B.B.S.

Resident

—Satish K. Menon, M.B.B.S.

Resident

*Department of Dermatology
Kasturba Medical College and Hospital
Manipal 576119, India*

REFERENCES

1. CAMPO-AASEN, I. and CONVIT, J. Histochemical identification of non-culturable mycobacteria (*M. leprae* and *M. lepraemurium*). II. Dopa oxidase. *Histochem.* **35** (1973) 63–66.
2. CHATTERJEE, A. Melanocytic activity in leprosy lesions with special reference to cellular infiltrate. *Lepr. India* **48** (1976) 142–148.
3. KATO, L. and ISHAQUE, M. *M. leprae* do not utilize DOPA. *Int. J. Lepr.* **45** (1977) 382.
4. NAYAR, A. and JOB, C. K. A study of epidermal melanocytes in hypopigmented patches of leprosy. *Indian J. Med. Res.* **58** (1970) 187–193.
5. PAPA, C. M. and KLIGMAN, A. M. The behaviour of melanocytes in inflammation. *Indian J. Med. Res.* **45** (1965) 463–473.
6. PARISH, J. A., WHITE, H. A. D. and PATHAK, M. A. Photomedicine. In: *Dermatology in General Medicine*. 2nd ed. Fitzpatrick, T. B., *et al.*, eds. New York: McGraw-Hill Book Company, 1979, pp. 942–994.
7. PRABHAKARAN, K. Hypopigmentation of skin lesions in leprosy—a hypothesis. *Lepr. India* **49** (1977) 462–463.
8. SINGH, K., IYENGAR, B. and SINGH, R. Hypopigmentation in leprosy. *Indian J. Lepr.* **55** (1983) 675–679.

Simplified Surgical Technique for Flexible Clawed Hand Rehabilitation

TO THE EDITOR:

It is current opinion that neuropathy is one of the most striking features of Hansen's disease^(3,5). In our experience in West Africa, many patients exhibit clawed hands due to the high prevalence of combined ulnar and median neuropathies. Unfortu-

nately, antimycobacterial treatments are ineffective in improving such a disability, and palliative surgery often appears the best way for rehabilitation.

The clawed fingers result from the denervation of the hand's intrinsic muscles; the interossei flex the basal phalanges and ex-

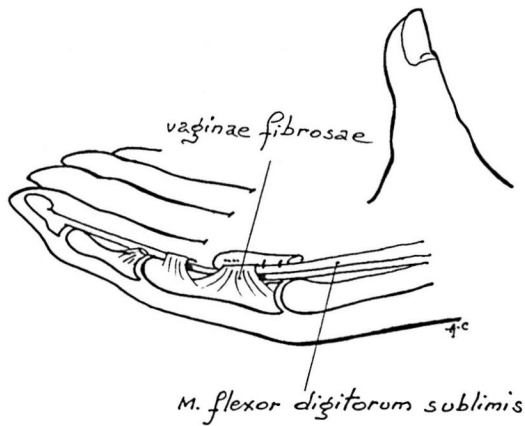


FIG. 1. Lasso technique.

tend the middle and distal ones. Hence, paralysis of the interossei results in: a) overextension of the basal phalanges by the extensor digitorum communis, and b) flexion of the middle and distal phalanges by the flexor digitorum sublimis (¹²).

The guideline to correct this disability is in limiting the overextension of the proximal phalanges and/or in controlling its flexion. Two main surgical techniques are currently used: a) passive means such as anterior capsuloraphy (¹) or tenodesis (¹¹) at the level of the metacarpophalangeal joint, and b) active means such as tendon transfer from nondenervated forearm muscles (extended, if necessary by grafts) to the distal interossei tendons (^{4, 6, 9, 10}) or directly to the proximal phalanx (⁷).

All of these techniques give excellent results when used by skilled operators. Most of them are rather time-consuming and need full technical equipment, frequently not available in endemic areas.

I propose a simplified version of the latest technique described by Zancolli (²) in which tendons of the flexor digitorum sublimis are removed from their insertions on the medial phalanges in order to be sutured to themselves after making a loop through the proximal part of the vaginae fibrosae digitorum manus ("Lasso" technique, Fig. 1).

As shown in Figure 2, this simplification consists of suturing the tendon directly to the fibrous sheath of the vaginae by means of 3/0 nonresorbable thread, without any section of tendon but maintaining the pha-

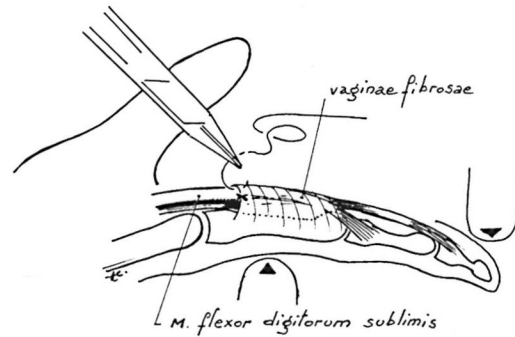


FIG. 2. Present technique.

langes in overextension while sewing. As soon as this intervention is performed, the hand with its fingers slightly bent is set in a cast for 3 weeks.

Thirty hands were operated on using this technique. One year later, the clawing had disappeared and no normal prehension persisted in 25 cases, a questionable result was observed in 3 cases, and 2 clawed hands needed to be reoperated with another technique.

This operation presents the following advantages: a) easy and fast realization permitting, for example, in the same operating time the restoration of thumb opposition, if needed (⁸); b) general anesthesia may be avoided; c) respect of anatomical integrity, allowing further intervention if necessary; d) no specific rehabilitation needed; e) no secondary deformities of the fingers in the long term.

I hope that the development of such a simplified technique will permit the rehabilitation of a greater number of disabled patients in leprosy-endemic countries.

—Alexis J. Chevillard, M.D.

*Head, Surgical Unit
Institut Marchoux
P.O. Box 251
Bamako, Mali*

Acknowledgment. This work was supported by the Raoul Follereau Foundation of France.

REFERENCES

1. BOURREL, P. Raccourcissement capsulaire métacarpo-phalangien et avancement des poulies des fléchisseurs dans les paralysies des muscles intrinsèques des doigts. Aspect technique et physiolo-

- gique—indications. *Ann. Chir. Plast.* **15** (1970) 27–33.
2. BOURREL, P. Variations de l'opération de Zancolli. *Médecine et Armées* (Paris) **1** (1973) 69.
 3. BRAND, P. W. Temperature variation and leprosy deformity. *Int. J. Lepr.* **27** (1959) 1–7.
 4. BRAND, P. W. Tendon grafting; illustrated by a new operation for intrinsic paralysis of the fingers. *J. Bone Joint Surg.* **43A** (1961) 444–453.
 5. BROWNE, S. G. Some common neurological findings in leprosy. *J. Neurol. Sci.* **2** (1965) 253–261.
 6. BUNNEL, S. Anatomy and function of intrinsic muscles and operation to restore muscle balance in clawed fingers. In: *Surgery of the Hand*. 3rd ed. Philadelphia: J. B. Lippincott Company, 1966, 435–565.
 7. BURKHALTER, W. E. and STRAIT, J. L. Metacarpophalangeal flexor replacement for intrinsic-muscle paralysis. *J. Bone Joint Surg.* **55A** (1973) 1667–1676.
 8. BURKHALTER, W., CHRISTENSEN, R. C. and BROWN, P. Extensor indicis proprius opponensplasty. *J. Bone Joint Surg.* **55A** (1973) 725–732.
 9. GIRAudeau, P. and CARAYON, A. Traitement palliatif des paralysies des intrinsèques des doigts par le grand palmaire prolongé par 4 bandelettes de fascia lata. A propos de 23 observations. *Rev. Chir. Orthop.* (Paris) **57** (1971) 147–150.
 10. LITTLER, J. W. Principles of reconstructive surgery of the hand. In: *Reconstructive Plastic Surgery; Principles and Procedures in Correction, Reconstruction and Transplantation*. Converse, J. M., ed. Philadelphia and London: W. B. Saunders Company, 1864, vol. 4, pp. 1612–1695.
 11. RIORDAN, D. C. Tendon transplantation in median-nerve and ulnar-nerve paralysis. *J. Bone Joint Surg.* **35A** (1953) 312–320.
 12. TRUEx, R. C. and CARPENTER, M. B. *Human Neuroanatomy*. 6th ed. Baltimore: Williams and Wilkins Company, 1969, p. 207.

Lipid Composition of Human Leprous Tissue

TO THE EDITOR:

Mycobacteria contain a high amount of lipid, mostly phospholipids and glycolipids⁽¹⁾. Analysis of skin biopsies of human and armadillo leprosy tissue showed the presence of high lipid content and also certain characteristic lipids of mycobacteria, such as mycolic acids, a 6-deoxyhexose containing lipid (glycolipid-1) and a wax ester^(6,8). This has led to speculation that mycobacteria may greatly contribute to the lipid and its metabolism in human lepromas. However, not many studies are available which have studied detailed lipid constituents in leprosy tissue of patients in the whole spectrum of leprosy. Therefore, in the present study lipid constituents in human leprosy tissue in the leprosy spectrum have been investigated, and an attempt has been made to explain the origin of the stored lipids in lepra cells.

Skin biopsies from active lesions were taken from 33 patients ranging in age from 25–45 years. The duration of the disease was more than 2 years in all cases. All were untreated patients taken from the leprosy clinic of the Postgraduate Institute of Medical Education and Research, Chandigarh, India. These patients had no known system-

ic disease, including diabetes mellitus, and hypertension and had normal electrocardiograms. All had the same degree of subcutaneous fat, exhibited the same level of nutrition, and were matched for age and sex for all groups. Of the 33 patients classified according to Ridley and Jopling⁽⁵⁾, 11 were lepromatous (LL), 9 borderline lepromatous (BL), and 13 had tuberculoid (TT) leprosy. Eleven healthy age- and sex-matched controls were included in the study. The bacterial index (BI) of the LL and BL patients ranged from 2+ to 6+ and in TT disease no bacilli could be detected in slit-skin smears. None of the patients was in reaction.

Lipids from the biopsy material were extracted with chloroform:methanol, 2:1 (v/v) partitioned with aqueous KCl, and an aliquot of the extracted total lipids was quantitated by gravimetry. Individual fractions of neutral lipids and phospholipids were separated by thin-layer chromatography with the solvent systems, petroleum ether: diethyl ether:acetic acid (90:10:1 v/v) and chloroform:methanol:aqueous ammonia 14 N (65:35:4 v/v), respectively. Using arithmetic reference standards and identifying the lipid spots by exposing to I₂ vapor,