The Long Posterior Flap Below-the-Knee Amputation for Leprosy

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ABSTRACT: Below-knee amputations were performed in 70 leprotic patients with malignant change in long standing neuropathic ulcer and useless deformed feet due to chronic infection of the tarsal bones; 58 achieved primary wound healing, 15 patients had delay healing from superficial infection. The surgical failure rate was 4.2 per cent; only three patients required surgical revision of the stump. Short term follow up of 41 amputees, ranging from two months to three years, revealed satisfactory results with no serious complication. This technique offers a significant advantage in healing rate and provides a good soft tissue padding of the stump in leprosy.

INTRODUCTION

Insensitive and deformed feet are the most common complication leading to an intractable neuropathic ulcer in leprosy. When treatment is neglected or inappropiate, the subsequent complications occuring as low grade infection, spreading to underlying bones, or malignant change in long standing neuropathic ulcer, amputation may be justified. For below the knee amputation, many techniques have been described to promote primary healing in vascular diseass, but no definite technique was recommended in leprosy.

Because of poor nutrition and wasting of the leg muscles in leprotic patients, which may have some problems of wound healing and soft tissue padding of the stump, the long posterior flap technique was selecled in seventy patients with leprosy in this study.

MATERIALS AND METHODS

From December 1984 to January 1988, at the Nonsomboon leprosarium, Khon Kaen, 70 patients with leprosy had below-knee amputation with a long posterior flap technique. There were 14 women and 56 men, ranging in age from 31 to 72 years; the mean age was 51.7 years. Primary diagnoses that led to amputation were malignant change of long standing neuropathic ulcers in 32 patients, chronic osteomyelitis of the tarsal bone with severely deformed foot in 35 patients, one painful Boyd amputation, one infected transmetatarsal amputation and one severe fungal infection of the foot.

Surgical technique

The patient was operated under spinal anesthesia and the tourniquet was used for hemostasis in all cases. The level of amputation was carried out at five inches distal to the tibial tuberosity.

The flap was designed before the skin incision was begun (Figure 1). The anterior incision was performed right down to the tibia and the bone was marked for the level of amputation. The fascia was then elevated proximally for about 1.5 centi-

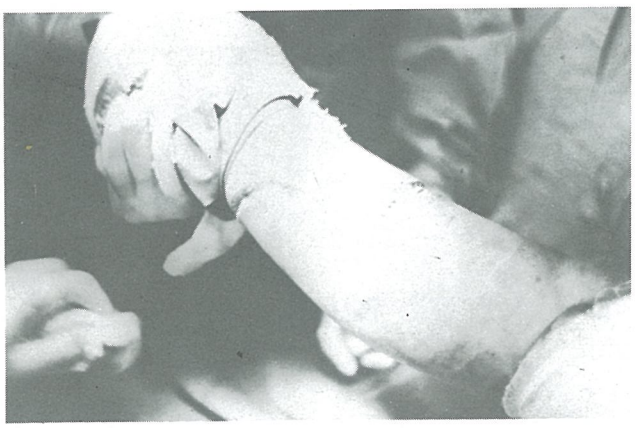

Fig. 1 The anterior incision was made at the level of the line section of the bone to half way of the anteroposterior diameter of the calf. The posterior flap is twice in length of the anterior incision.

meters and Gigli saw was used to devide the bone. As the saw cut proceded anteriorly an anterior bevel with gentle rounding was fashioned. Usually very little rongeuring was necessary after sectioning of the titia. The fibula was sectioned about 1.5 centimeters shorter than the tibia, also with the Gigli saw. With an amputation knife, the gastrocnemius-soleus muscle complex was beveled to the distal point of the posterior flap (Figure 2). The main vessels were ligated after transection of the bones and posterior compartment muscles. Additional muscles were trimmed as necessary. A suction or Penrose drain was generally sued, and closure was accomplished by suturing the posterior fascia to the pretibial fascia with interupted sutures. The skin was closed with interrupted nylon or silk sutures (Figure 3).

The postoperative dressing usually consisted of soft, non adherent gauze over the wound, gentle compression and contouring the stump using a six-inch webril for application. Rigid dressing by plaster cast was applied in cases using a suction drain, and compression dressing by elastic bandage was performed in cases using Penrose drain. None of the patients were fitted with a walking cast and pylon.

Postoperative Management

The drain was removed within seventy-two hours. The plaster cast was not removed for two weeks unless there was significant sign of wound infection, such as purulent discharge, increasing pain or progressive fever elevation. When the cast was removed, if healing had progressed without evidence of necrosis or infection, the sutures were removed. The patient was trained to bandage his stump and ambulate with crutches nutil the definitive prosthesis was available. (Figure 4)

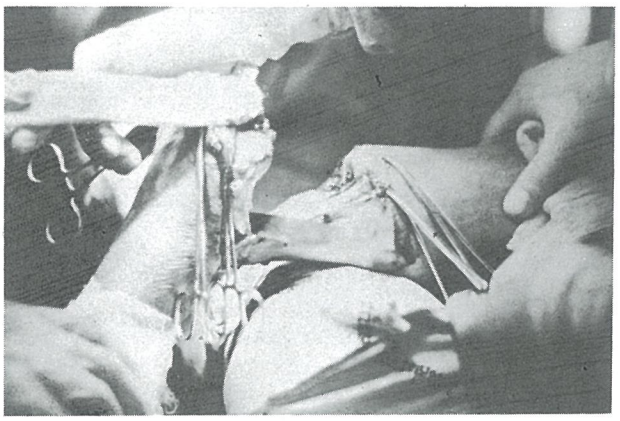

Fig. 2 The amputation knife was used to bevel the posterior flap to the distal part as a unit of myocutaneous flap.

RESULT

Post-Operative result and short term follow up

Fo 70 patients, 52 (74%) achieved primary wound healing. The delayed healing in fifteen of 18 patients was due to superficial infection in some part along the suture line. Two cases required exploration and drain=age of hematoma collection and deep infection and achieved secondary healing. Only one case was revised to a higher level below the knee due to flap necrosis (Table 1).

Only 41 patients had been follow-up for more than two months (Table 2). Follow-up periods ranged from 2 to 36 months; the means was 14

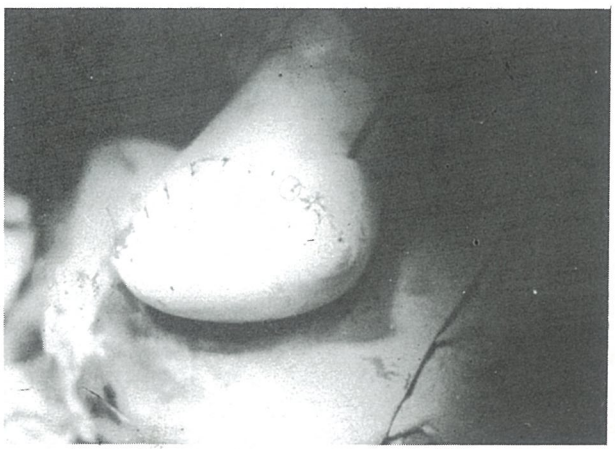

Fig. 3 The stump was closed by interupted nylon silk suture without tension.

Fig. 4 One month post-operative period, the stump showed a good contour with well soft tissue padding.

TABLE 1
Postoperative Results and Complications.

Results and Complication	Cases	Percent
Primary healing	52	74.3
Delayed healing	18	25.7
Flap necrosis	1	1.4
Hematoma	1	1.4
Infection : deep	1	1.4
: superficial	15	21.5
Total	70	100

TABLE 2
Short Term Follow up

Prosthesis	Case	Male	Female	Range (Mo)	Average	SD
Use	29	28	1	5 – 36	16.8	8.4
Note use	12	9	3	2 – 32	7.3	9.2
Total	41	37	4	2 – 36	14.0	9.6

months. Of the 41 patients 29 were fitted with prostheses and used them functionally. The average interval between surgery and prosthetic fitting was 3.7 months. In the twelve patients who were not fitted with prostheses, the most common reason was the economic problem. There were four patients who were lost to follow up after two months post-operatively in whom no immediate complication was encountered. Two patients had debilitating conditions one from cerebrovascular accidents with resultant motor paralysis of affected side; the other one from motor weakness due to residual poliomyelitis prior to amputation. There was one old bilateral amputee, who had a previous below-knee amputation on the opposite side, preferred using homemade wheel chair to prostheses.

Of 41 patients, 21 had minor complications. Fifteen patients who used the prosthesis had pressure sore from improper local made prosthesis (Figure 5). The sites of pressure sore were fibula head in eight patients, prepatellar tendon in four and three patients were affected at pretibial area of the distal part of the stump. Two patients had flexion contracture about five degrees without any problem in fiftting the prosthesis. All except four had good coutour with sufficient soft tissue padding of the stump. Four patients who had redundant soft tissue of the stumps were due to excessive soft tissue of the posterior myocutaneous flap. There was no serious complication that required revision of the stump (Table 3).

Fig. 5 The various types of local-made prostheses were used by the patients in this study.

TABLE 3
Late Complication in 41 cases

Complication	Prosthesis		Total
	Use (29 cases)	Not use (12 cases)	
Flexion contracture	1	1	2
Redundant of soft tissue	1	3	4
Pressure sore	15	–	15
Total	17	4	21

DISCUSSION

There are two main types for below the knee amputation, one is the sagittal flap technique which is prefered by some authors[1-3] and the other is the coronal flap technique which may be an equal anteroposterior or a long posterior flap. For vascular disease or disabetic patients, the long posterior flap has been widely accepted as standard technique as it is thought to reduce the risk of failure of wound healing[4-7] In this study, this technique also provided a good result of healing for leprosy with only 4.2 per cents of surgical failure. The sufficient and good quality of soft tissue padding of the stump is the special advantage of this technique for leprosy that the other technique may have a troblesome.

Because of poor patient complicance, only 41 patients (58%) had been followed up for more than two months. All patients had satisfactory functional result of the stump without any serious complications such as stump breakage and painful stump. Major complication was usually due to improper locally made prostheses which was a minor abrasion or pressure sore. This problem improved later after we have a well trained prosthetist that can fabricate a prothesis by using available materials and produce it locally within leprosarium to reduce the cost to the level which our patients can afford.

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