

Strategic Reconstruction of Diabetic Foot

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Abstract : Diabetic foot is one of the most frequent complications with nephropathy and retinopathy in patients with diabetes mellitus. Approximately 4.9% of diabetic patients admitted suffer from foot problems and it tends to increase every year. The major causes of diabetic foot have been known to be diabetic neuropathy and peripheral vascular diseases. The objective of this study was to devise a strategic surgical treatment of the diabetic foot for limb salvage and early ambulation. We studied 22 cases of diabetic foot of 20 patients for 4 years since May, 1998. The patients included 13 males and 7 females in age ranging from 37 to 68 (mean 52) years. According to the sites of the wound involved, we classified the patients into 4 groups and the surgical operations were performed for restoration of the function of the site involved. Except one patient who had received skin graft, all the patients had primary wound healing in operated sites without specific complications and they were able to do early ambulation. We concluded that, with appropriate preoperative evaluation and operation, effective postoperative care would reduce amputation rate and help to achieve early rehabilitation.

Key Words : Diabetic foot, Strategic reconstruction

가 가 가 가 가 22 가 20
가 , 가 ,
. (retinopathy) (nephropathy) 2.
[1] 1981
가 1988
4.9%가
15% 150 가
[2].
가
가 2 X
가 50% [3]. 3 (3-phase bone scan)
(distal artery bypass procedure)
가
3.
가 , 가
가
1.
1998 5 2002 6
(1) (foot dorsum)

1) . 가 9

18 (90%) , 12 (60%) 2 (n = 8), 6

(*Staphylococcus aureus*) 11 2

가 8 , (free transverse rec-

가 3 . tus abdominis muscle flap)

3 2 (Fig. 1).

1 (peroneal artery) 가 (n = 6),

가 (Table 1). 2

1 4 1.6 1 1

Table 1. Preoperative evaluations

Case	3-phase bone scan	Doppler	Angiogram
1	reactive change		
2	pyogenic arthropathy		
3	cellulitis	unspecific	unremarkable
4	cellulitis	unspecific	unremarkable
5	reactive change		
6	cellulitis		
7	reactive change		
8	cellulitis	unspecific	unremarkable
9			
10	cellulitis		
11	cellulitis		
12	cellulitis	minimal arteriosclerosis	minimal arteriosclerosis
13	cellulitis	unspecific	unremarkable
14	osteomyelitis	unspecific	unremarkable
15	cellulitis	unspecific	unremarkable
16	cellulitis		
17	cellulitis	unspecific	
18	osteomyelitis	unspecific	unremarkable
19	cellulitis		
20	cellulitis		

가
 , 가 ,
 2 가
 , 가
 (free gracilis muscle flap) 1
 가 . 1
 (Fig. 3),
 1/4 가
 (Fig. 4).
 1 가 . 1
 가 . 8
 가 가 .



Fig. 1. (Left) Infected ulcer with exposure of tendons and bone on the right foot dorsum. (Right) Free transverse rectus abdominis muscle flap with split thickness skin graft were performed. Postoperative 24 months view.



Fig. 2. (Left) Chronic ulceration with exposure of bone on the left foot first great toe. (Right) Reverse medial plantar flap was performed. Postoperative 38 months view.



Fig. 3. (Left) Large infected ulceration with exposure of tendons on the left heel. (Right) Medial plantar island flap was performed. Postoperative 34 months view.



Fig. 4. (Left) Huge necrotic ulceration with exposure of tendons and bones from heel to dorsum of the right foot. (Right) Free transverse rectus abdominis musculocutaneous flap was performed after extensive debridement of nonviable tissue and bones. Immediate postoperative view.

(etiopathologic)

[6].

(chronic sensorymotor neuropathy) (autonomic neuropathy)

[4].

[5]

54.7% 가

33.0% 가

가

(intrinsic foot muscle) (extensor tendon) 가

(clawing of the toes), (pescavus), [7].
가 Charcot
가 가 [8]. 가 [12]. 가
가 Charcot [13].
(arteriovenous shunting) (streptococci)
가 [14], 가 [15].
[6]. [9] 50% 36%
77.8% 22.2%
90% 가 가
artery) (tibial 가 가
가 [1]. 가 가
가 8 1 가 가
가 가 가 가
[10]. (callus)
60% 가 가 30% 가
가 가 가 가 [16].
가 가
가 [11].

dextran(Rheodex-D , 20 mg/kg, IV)
PGE1(Prostandin , 10 ng/kg/min, IVF) 5

가

가 , 가

가

[17].

가 가

가

4

가

20

2

가

가

가

가

가

가

가

1.

1989; 13:

39-45.

가

2

2. John MS Jr, Lawrence BC. Foot reconstruction in diabetes mellitus and peripheral vascular insufficiency. *Clin Plast Surg* 1991; **18**: 467-81.

가

3. Ecker ML, Jacobs BS. Lower extremity amputation in diabetic patients. *Diabetes* 1970; **19**: 189-92.

4. Boulton AJM, Conner H. The diabetic foot. *Diabet*

- Med* 1988; **5**: 796-8.
5. 1996; **23**: 265-75.
 6. Heater JM, Andrew JMB. The pathophysiology of diabetic foot ulceration. *Clin Podiat Med Surg* 1995; **12**: 1-17.
 7. Lippman HI. Must loss of limb be a consequence of diabetes mellitus. *Diabetes Care* 1979; **2**: 432-7.
 8. Cavanagh PR, Young MJ, Adams JE, Vickers KL, Boulton AJM. Radiographic abnormalities in the feet of patients with diabetic neuropathy. *Diabetes Care* 1994; **17**: 201-9.
 9. 2002; **29**: 83-90.
 10. Boulton AJM, Knight G, Drury J, Ward JD. The prevalence of symptomatic diabetic neuropathy in an insulin-treated population. *Diabetes Care* 1985; **8**: 125-8.
 11. Fernando DJS, Masson EA, Veves A. Relationship of limited joint mobility to abnormal foot pressure and diabetic foot ulceration. *Diabetes Care* 1991; **11**: 8-11.
 12. Wilson RM. Neutrophil function in diabetes. *Diabet Med* 1986; **6**: 509-12.
 13. Gregory MC, Peter RC, Jan SU, Gary WG, Adolf WK. Assessment and management of foot disease in patients with diabetes. *N Engl J Med* 1994; **331**: 854-60.
 14. Jones EW, Edward R, Finch R, Jeffcoate WJ. A microbiological study of diabetic foot lesion. *Diabet Med* 1985; **2**: 213-5.
 15. Wheat LJ, Allen SD, Henry M, Kernek CB, Siders JA, Kuebler T, *et al.* Diabetic foot infections: bacteriologic analysis. *Arch Intern Med* 1986; **146**: 1935-40.
 16. Young MJ, Cavanagh PR, Thomas G, Johnson MM, Murray H, Boulton AJM. The effect of callus removal on dynamic plantar foot pressure in diabetic patients. *Diabet Med* 1992; **9**: 55-7.
 17. Curtin JW. Functional surgery for intractable condition for the sole of the foot. *Plast Reconstr Surg* 1977; **59**: 806-11.