



AN ATTEMPT SHOULD BE MADE TO CONSERVE THE LIMB IN ALL BAD DIABETIC FOOT PATIENTS HAVING KETOSIS & SEPTICEMIA.

KEY WORDS

prevalence, foetomaternal outcome

Dr Sachin S Jain (MS General Surgeon)	Dr Sanjay Agrawal (MD Medicine and Diabetologist)
Dr Arif Kaderi (MS General Surgeon)	Dr Abhang Satshil C. (Second year Surgery Resident)
Dr Sanam S Somani (First Year Surgery Resident)	

INTRODUCTION

Diabetes is global disease with rural & urban population involved almost equally. Now a days incidence of diabetes has dramatically risen in rural population due to change in food habits & sedentary life style. Diabetic patients require continue treatment in the form of antidiabetic tablets & insulin. Diabetes is a systemic disease involving eyes, blood vessels, kidneys. In rural population we do see above systems affected because of diabetes but the commonest problem is diabetic foot infections due to poor hygiene & illiteracy.

Diabetic foot patients many times have abscesses, non-healing ulcer, dry/wet gangrene of toes & maggots. These patients often require surgeries in the form of I & D, debridements, fasciotomies, amputation of gangrenous toes & removal of maggots. In extreme cases patients are having very bad neglected diabetic foot having gross cellulitis, dry & wet gangrene of skin/toes & pictures of necrotising fasciitis, compartment syndrome. These patients are usually in bad ketoacidosis & septicemia requires immediate admission, vigorous medical/surgical management & many times land up with amputations as life saving measures. After AK & BK amputations with modern prosthesis, patients can have near normal life. But after amputation psychosocial impact is very much high, which affect quality of life.

Here in this series we have studied 10 bad diabetic foots having gross cellulitis, dry/wet gangrene of skin/toes and compartment syndrome and gross septicemia and ketoacidosis. We have given trial of limb conserving surgeries to save the foot. IN 80% of our patients we could save symes & BK amputations.

Case Selections

All the patients were from Dhule & Jalgaon districts 60Kms from Dhule city. Patients age groups was from 50 to 70 yrs male as well as female. Patients were selected-

- 1) Almost all patients were in septicemia, ketoacidosis & grossly uncontrolled DM.
- 2) All patients were from ASA grade I to III
- 3) 2 patients had mild jaundice may be due to septicemia
- 4) 4 patients renal parameters were affected because of septicemia.

All the patients were counselled before hand that limb conserving surgery is just an attempt if procedure fails we might have to take patient for amputation. Importance of admission, diet control, anti-diabetic treatment, daily serial debridements & dressing explained to relatives.

Clinical photos



Preoperative investigations profile of 10 patients as follows-

Sr .no	HB gm/dl	WBC count Polymorphs %	Sugar F PP mg/dL	S. creat	S, Bilirubin	Urine ketones	Urine sugar	Urine proteins
1	10	18000/79	236/360	1.9	2.6	++	++++	++++
2	9.6	20000/80	300/399	2.2	2.8	+++	++++	++
3	9	19900/80	249/378	2.6	1.6	+++	++++	+++
4	8.8	27000/80	298/380	2.4	1.6	+++	++++	++
5	9.8	26000/82	290/410	1.4	1.2	+++	+++	++
6	10.3	30000/80	280/420	1.6	1.2	++	+++	+
7	11	23000/80	320/450	1.4	1.3	++	+++	+
8	10.2	21800/79	290/400	1.38	1.2	+	+++	+
9	9.8	24500/79	260/388	1.02	1.3	+	+++	++
10	9.8	27200/80	298/398	1.3	1.2	+	+++	+

Preoperative preparation-

- 1) Patients admitted with physician/diabetologist for medical management.
- 2) All patients were put on Insulin pump immediately with every 2 hrly sugar monitoring along with urinary ketones.
- 3) All patients kept nil by mouth.
- 4) Four patients were in bad septicemia with renal involvement,so were given nasal O2 4litre/min.
- 5) Immediate doses of antibiotics according to renal/hepatic safety given in appropriate doses .Antibiotics used were among Amoxclav/Ceftriaxone/Sulbactam/Clindamycin/Amikacin/Metrogyl which were altered after 48hrs due to availability of pus culture/sensitivity reports.
- 6) IV fluids given for adequate hydration/nutrition/Adequate u/o.
- 7) All diabetic feet washed with antiseptic soap. Dried & dressing +done with betadine/tinidazole ointment.
- 8) Strict limb elevation given.
- 9) Evaluation done by surgeon.8 patients we could operate immediately but 2 were operated after 24 hrs because of gross ketosis to be settled first.

Anaesthesia:

Evaluation by anaesthetist done simultaneously.

- 1) Very little dose of preanaesthetic drug given considering ketosis/septicemia.
- 2) All patients operated under low spinal anaesthesia with O2 supplement given as 3litres/min.
- 3) Analgesia in the form of either diclofenac or tramadol suppository given according to renal status.
Duration of surgery on an average 40 minutes to 1hr required.Many patients required (7) revision surgery in the form of amputation/skin grafting.

Surgical techniques:

Type of surgery	No. Of patients
I & D/Debridements	10
Amputation of toes	7
Symes amputation	1
BK amputation	1
Fasciotomy	10
Maggots removal	3
Skin grafting	5
Secondary suturing	2

Surgical techniques:

- 1) All patients required I & D and debridement to remove pus ,pus flakes & dead tissue.
- 2) In this series 7 patients required amputation of toes for wet/dry gangrene.
- 3) One patient required Symes amputation as revision surgery.
- 4) One patient required BK amputation.

- 5) All 10 patient required fasciotomies in foot & 5 patients required fasciotomies in leg.
- 6) 3 patients had maggots & were removed.
- 7) 5 patients required skin grafting.
- 8) 2 patients required secondary suturing for wound closure.
- 9) Pus for culture & sensitivity sent.
- 10) All patients were given wash with hydrogen peroxide,betadine & normal saline.
- 11) Complete haemostasis seen, which is the key of success in this series.Bleeders were either cauterised or ligated with catgut 1-0.
- 12) In 5 patients skin grafting was done after 10-15 days of primary surgery on day care basis.

Observations & Results:

- 1) Post operative recovery was smooth in all patients as very low spinal anaesthesia with little sedation given.
- 2) Patients were completely awake & could void urine in another 6-8 hrs.
- 3) One patient required Symes amputation on day 3.
- 4) One patient required BK amputation on 3rd day as ongoing septicemia/ketosis was not under control. It was done as life saving measure & failed trial.
- 5) All patients given liquids to soft diet after 6-8 hrs.
- 6) All patients were under strict surveillance of physician.
- 7) Antibiotics given & changed according to C/S report availability.
- 8) All patients were discharged on & around 5th to 10th day of surgery.
- 9) 3 patients required admission for 12 days.

Follow up:

- 1) Patients from city area were advised to f/u daily for dressing.
- 2) Other patients near by city area were advised sterile dressings by general practitioners at P.H.C. with strict f/u every 7 days.

All patients were counselled about the importance of patience,daily dressing,antibiotics,antidiabetic treatment,rest & strict limb elevation. They were also explained the importance of regular f/u.

Post op treatment:

Inj. Mixtard in divided doses according to BSL-F/PP,urine sugar-F/PP.
Cap.clindamycin 300mgBD to complete 14 days therapy.
Tab.Metrogyl 400mgBD for 7 days therapy.
Tab.Trypsin/chymotrypsin/Bromelain for 10 days.
Tab.Multivitamins with vitamin-C for 3 months.
Cap. Amino acids to built up patients nutritionally.

All patients foot healed in time period of one&half months to 3months. Except 2 patients of Symes & BK amputation improved catastrophically after revision surgery.

Benefits noted:

- 1)Could save 8 feet from amputations.
- 2)Low incidence of post op morbidity due to low spinal anaesthesia.
- 3)Minimal disruption to patients & their family.
- 4)Early return to work with clutches life.

Conclusion:

An attempt should be made to conserve the limb in bad diabetic foot patients as happened in 10 patients studied in this series as 80% success rate which is considerably high.

Extensive cellulitis with dry & wet gangrene of foot with septicemia/ketosis can be given fair trial of limb conserving surgery as serial debridements & skin grafting on follow up.

References:

- 1 Tallis A, Motley TA, Wunderlich RP,Dickerson JE, Waycaster C, Slade HB. Clinical and economic assessment of diabetic foot ulcer debridement with collagenase: results of a randomized controlled study. Clin Ther. 2013;35:1805-1820. [PubMed]
- 2 Lebrun E, Tomic-Canic M, Kirsner RS. The role of surgical debridement in healing of

- diabetic foot ulcers. *Wound Repair Regen.* 2010;18:433–438. [PubMed]
- 3 Edwards J, Stapley S. Debridement of diabetic foot ulcers. *Cochrane Database Syst Rev.* 2010;(1):CD003556.
- 4 Jain AC. A New Classification (Grading System) of Debridement in Diabetic Lower Limbs-an Improvization and Standardization in Practice of Diabetic Lower Limb Salvage around the World. *Medicine Science.* 2014;3:991–1001.
- 5 Steed DL, Donohoe D, Webster MW, Lindsley L. Effect of extensive debridement and treatment on the healing of diabetic foot ulcers. Diabetic Ulcer Study Group. *J Am Coll Surg.* 1996;183:61–64. [PubMed]
- 6 Saap LJ, Falanga V. Debridement performance index and its correlation with complete closure of diabetic foot ulcers. *Wound Repair Regen.* 2002;10:354–359. [PubMed]
- 7 Cardinal M, Eisenbud DE, Armstrong DG, Zelen C, Driver V, Attinger C, Phillips T, Harding K. Serial surgical debridement: a retrospective study on clinical outcomes in chronic lower extremity wounds. *Wound Repair Regen.* 2009;17:306–311. [PubMed]
- 8 Attinger CE, Bulan E, Blume PA. Surgical débridement. The key to successful wound healing and reconstruction. *Clin Podiatr Med Surg.* 2000;17:599–630. [PubMed]
- 9 Wilcox JR, Carter MJ, Covington S. Frequency of debridements and time to heal: a retrospective cohort study of 312 744 wounds. *JAMA Dermatol.* 2013;149:1050–1058.