ORIGINAL RESEARCH PAPER

Plastic Surgery

METATARSAL HEAD RESECTION FOR DIABETIC FOOT ULCERS.

KEY WORDS: Metatarsal Head,excision,diabetic Foot,ulcer,plantar Aspect.

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ABSTRACT

Fifteen diabetic patients underwent 12 metatarsal head resections for chronic neuropathic ulceration. All ulcers were located on the plantar surface beneath the metatarsophalangeal joints.The ulcers had been present for a mean of 9.5 +/- 7.5 months before operation, yet they healed in a mean of 1.5 +/- 1.6 months postoperatively. None recurred during the mean follow-up time of 11.0 +/- 11.0 months. Moderate peripheral vascular disease, impaired renal function, and retinopathy did not affect the time required for ulcer healing. There were two complications: one wound infection and one hematoma. No extremities were lost, and none of the patients suffered any long-term sequelae. We recommend metatarsal head resection to achieve the healing of chronic diabetic foot ulcers under the metatarsophalangeal joints.Overall, the long-term complication rate was lower in the operative than in the medical treatment group. Also, the infection rate was greater in the medical treatment group than in the operative group. Comparing early and late clinical outcomes of metatarsal head resection surgery and medical treatment showed complete superiority for the surgical approach, and metatarsal head resection is more completely cost beneficial than the medical approach.

INTRODUCTION

Diabetic foot ulcer (DFU) is not only a patient problem but also a major health care concern throughout the world. Diabetic foot ulcer is one of the common and serious complications in diabetic patients . The risk of patients with diabetes mellitus (DM) developing a foot ulcer at some time in their life could be as great as 15%, and foot ulcers are found in 12% to 25% of those with DM.

The annual incidence of foot ulceration is >2% among all persons with DM and 5% to 7.6% among those with DM and peripheral neuropathy

Amputation from complications related to DM place an individual at risk of an additional amputation and result in a 5-year mortality rate of 39% to 68%.

The main fundamental principal of the procedure included excising the metatarsal heads and part of the neck.

The plantar aspect of the metatarsal head is a common location for ulcer formation in diabetic patients because of biomechanical overloading forces, which lead to the necessity for surgical off-loading and healing of this area.Fig(1)

Fig(1)

METHODS AND MATERIALS

The ulcers were classified using the Wagner grading system. All the patients in both groups had stage 1 or 2 ulcers. Those with stage 3 and those with ischemic ulcers were excluded from the present study. All patients with ischemic ulcers, as determined by a vascular surgeon, were also excluded from the present study.

As is well known, patients with diabetic neuropathy and Charcot's osteoarthropathy often have warm dry feet with good skin perfusion and ulcers at the pressure points, typically beneath the metatarso phalangeal joints. We had no case in which the patient's operation incision did not heal because of ischemia.

Patients in the medical group were referred to the vascular clinic for consultation if they were thought to have peripheral arterial disease or if they believed the ulcer was ischemic.

If not, they would receive medical therapy without the referral. However, 76% of the medical group did not have peripheral vascular disease, which was evident by the diminished wound area and depth after medical treatment.

As a part of the postoperative protocol, all patients received a well-padded plaster splint for 2 weeks postoperatively, with which they were allowed full weightbearing. They were not encouraged to walk long distances but were recommended to walk around indoors.

Dressing changes of the plantar ulcer were performed daily until complete healing. After each dressing change, the splint would again be placed on the foot. The ulcers had often healed after 2 weeks, at which time, the splint was permanently removed

CONCLUSIONS

Principally, amputation is specified for extensive and irreversible diabetic foot lesions. However, amputation leads to complete patient disability and disturbed quality of life.

Thus, it is important, through surgical management of the damaged foot, to preserve efficient and functional limbs. Furthermore, although medical approaches can result in lower surgical overload, its therapeutic efficacy seems to be lower in the affected patients.

In the present study, the early and late outcomes of both medical treatment and MHR were compared. Assessment of the wound healing showed that wound healing occurred more efficiently in the operative group than in the medical group.

We found more ulcer recurrence after medical therapy and also more infections. A comparison of complications showed that MHR is a better choice of treatment because it results in fewer patient morbidities and complications. Additionally, the mean duration of wound healing in the medical treatment group was 10.3 times longer (in days) than in the operative treatment group. Also, healing occurred significantly more quickly after MHR. We have clearly demonstrated that both early and late complications were significantly lower in those patients who underwent surgery than in the medical group.

Thus, overall, the operative approach will be superior to a medical regimen in early and long-term outcomes in patients with DM and neuropathic diabetic foot ulcers located at the plantar aspect of the metatarsal heads. In conclusion, fewer complications, ulcer recurrence, and hospitalizations and faster and better wound healing (all considered as early and long-term clinical outcomes) after MHR have demonstrated the complete superiority of the surgery compared with the medical approach for treating neuropathic diabetic foot ulcers located at the plantar surface of the metatarsal heads.

Finally, MHR is more costeffective and is a better treatment than the medical approach alone.

RESULTS

No difference was found in the distribution of the ulcer location under the metatarsal heads between the 2 treatment groups.. The incidence of wound healing was greater in the surgical group than in the medical treatment group .

Also, wound healing occurred earlier in the surgical group . Thus, the healing process was more efficient after MHR than with the medical approach. The recurrence rate was inversely greater in the medical treatment group ($p < .001$).

Also, the hospitalization rate was significantly greater in the medical treatment group.

The infection rate (defined as the number of infections treated in the outpatient clinic or resulting in hospitalization after treatment and/or discharge from the hospital) was greater in the medical treatment group than in the surgery group (56.0% versus 0.0%; $p < .001$).

The time needed for wound healing in the medical treatment group was 10.3 times longer (calculated as days of healing) than that in the operative treatment group. Thus, this should be a key factor in choosing the most appropriate treatment modality

REFERENCES:

1. Meinecke R, Keller R. Indication and contraindication of metatarsal head resection in foot deformities. Beitr Orthop Traumatol 17:321–324, 1970.
2. Wieman TJ, Mercke YK, Cerrito PB, Taber SW. Resection of the metatarsal head for diabetic foot ulcers. Am J Surg 176:436–441, 1998.
3. Pieggassi A, Schipani E, Campi F, Romanelli M, Baccetti F, Arvia C, Navalesi R. Conservative surgical approach versus non-surgical management for diabetic neuropathic foot ulcers: a randomized trial. Diabet Med 15:412–417, 1998.
4. Griffiths GD, Wieman TJ. Metatarsal head resection for diabetic foot ulcers. Arch Surg 125:832–835, 1990.
5. Burns S, Jan YK. Diabetic foot ulceration and amputation. In: Rehabilitation Medicine, p. 1, edited by CT Kim, InTech, Oklahoma, 2012.
6. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA 293:217–228, 2005