

## Why do I Choose Surgery to Treat Diabetic Foot Osteomyelitis? A Personal View

Dr. F. Javier Aragón Sánchez\*

*pain*

Osteomyelitis is one of the most frequent diabetic foot infections, accounting for 10-15% of mild infections and almost 50% of severe infections [1]. The treatment of osteomyelitis of the foot in patients with diabetes continues to spur debate and so far optimal treatment is yet to be defined [2-5]. The major continuing controversy centres on the relative roles of surgery and antibiotic treatment [5]. There are two principal approaches to the treatment of osteomyelitis of the foot in 12(r )1(co)12(n)19(t)-5(1(t)-5(1(t)-5(1(t)(in 125)-6(h)4(e r-8(e)- c )1(com)23(y)-5(c4(l(in 125)-6(l )1e)3c2(n)8(s [1(e)- 29(y av9(t)-5(i)7(v)8(e r)11(t)-

the remaining 10% had minor amputations. No major amputations were carried out in this selected group. Complete healing was achieved by secondary intention at 8 weeks [11]. However, there are several unresolved issues associated with surgical treatment for diabetic foot osteomyelitis. Who needs early surgery? [8] Should antibiotics be given for one month to reduce soft tissue infection, and the patient then offered elective bone surgery? [16] Should surgery be early performed and followed by postoperative culture-guided antibiotics based on bone samples? [6,11] What type of surgery should be performed? [8] Who can safely perform this surgery? Are recurrences and reulcerations more frequent with surgery than without? When can a patient who undergoes treatment for osteomyelitis be considered cured? [6,11] Several different answers to the last question can be found in existing literature regarding remission criteria. These include the resolution of clinical findings [17], the absence of any sign of infection at the initial or contiguous site [18], limb salvage [9,19] and wound healing [11,20]. There is no current consensus about it. In my opinion, the cure of osteomyelitis should be defined as the complete epithelialisation of the ulcer and/or surgical wound that was created whilst treating the infection without recurrence. Several authorities have noted that with appropriate wound care and loading a soft tissue wound can heal while underlying bone infection remains. That would be possible exclusively during a short period; if the bone infection persists, the wound will reopen [8].

Our outcomes cannot be explained by surgery alone because postoperative antibiotics based on bone cultures taken during surgical procedures were given. The median length of time for which any type of antibiotic was given was 36 days [11]. Previous reports treating patients exclusively with antibiotics used longer periods of antibiotic therapy. There were differences in the duration of antibiotic therapy determined by patient characteristics. Patients with peripheral arterial disease, those who needed reoperation, and those who underwent open transmetatarsal amputations required longer periods of antibiotic therapy [11].

In my opinion, when the bone is exposed and when osteomyelitis is accompanied by extensive radiological damage, progressive bone destruction seen in sequential x-ray images, gangrene, or destruction of the soft tissue envelope and spreading of soft tissue infection, surgery must be carried out as soon as possible in order to prevent a more proximal level of amputation. In cases of chronic osteomyelitis without these complications one could opt for exclusive use of antibiotics or surgery but one cannot predict with certainty for which of the patients medical therapy will fail and the failure could be associated with a more proximal level of amputation.

Recently, we have published a randomised trial comparing the outcomes of medical versus surgical treatment in patients with diabetes and forefoot osteomyelitis without ischaemia or soft tissue infections [21]. Antibiotics and surgical treatment had similar outcomes in terms of healing rates, time to healing, and short-term complications in patients with neuropathic forefoot ulcers complicated by osteomyelitis without ischaemia or necrotising soft tissue infections. However, this study was carried out in a highly specialised centre and it is unknown whether these outcomes could be achieved in other not so specialised centres. On the other hand, patients with ischaemia and foot osteomyelitis could have different outcomes.

Currently, our usual approach is to perform early conservative surgery followed by antibiotic therapy and reoperation if necessary. This procedure has some advantages: duration of antibiotic therapy is shorter than in medical series of treatments; the rate of infection

recurrence is low; healing is achieved in a reasonable period of time; amputation is avoided when no ischaemia or soft tissue infection is present; and there is a low rate of *major* amputations. The disadvantages are: cost effectiveness is unknown, hospitalisation is required (though outpatient surgery is a possible option) and so are experienced diabetic foot surgeons, reoperations and readmissions could be necessary, and the effects on patients' quality of life are unknown.

The optimum management of diabetic foot osteomyelitis remains one of the most controversial issues when dealing with diabetic foot syndrome. More research is needed from other working groups.

## References

- 1.

18. Senneville E, Lombart A, Beltrand E, Valette M, Legout L, et al. (2008) Outcome of diabetic foot osteomyelitis treated nonsurgically: a retrospective cohort study. *Diabetes Care* 31: 637-642.
19. Game FL, Jeffcoate WJ (2008) Primarily non-surgical management of osteomyelitis of the foot in diabetes. *Diabetologia* 51: 962-967.
20. Lesens O, Desbiez F, Vidal M, Robin F, Descamps S, et al. (2011) Culture of diabetic foot osteomyelitis. *Clin Microbiol Infect* 17: 285-291.
21. Lázaro-Martínez J, Aragón-Sánchez J, García-Morales E (2013) Antibiotics versus conservative surgery for treating diabetic foot osteomyelitis. A randomized comparative trial. *Diabetes Care* .