

The role of skin xenografts in the treatment of diabetic foot

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Background and Aims: Chronic non-healing diabetic foot ulcers are a common medical problem that may be the cause of severe complications such as osteomyelitis and amputation.

Skin grafting provides an effective means of closing acute and chronic wounds, but the availability of autologous grafts and price of tissue-engineering dermal equivalents may represent burden for local therapy. The aim of our study was to determine if a skin xenograft could promote the healing of chronic non-healing diabetic foot ulcers including infected wounds and to assess the complication rate of this treatment.

Material and Methods: Forty-five patients with chronic non-healed diabetic foot ulcers at least 2 months before graft treatment, stage Wagner 2 and 3, and treated with the skin xenografts were retrospectively recruited from our foot clinic during a 3-years period (1 January 2003 to 31 December 2005). Skin xenografts are dermal-epidermal grafts taken from pigs and sterilized with Furantoin, Gentamicin and Chloramphenicol. Prior to the application of xenografts, ulcers were cleaned from necrosis and microbial swab was taken. Patients with mild infection of Staphylococcus aureus and resistant pathogens (Methicilin-resistant Staphylococcus aureus - MRSA and Pseudomonas aeruginosa), which comprised a substantial number of patients with diabetic foot ulcers and are not suitable for autologous skin grafting or tissue-engineering, were also included. Skin grafts were changed every three days. All patients also had standard treatment of diabetic ulcers including off-loading and antibiotic treatment in the case of presence of local signs of infection. Patients were followed-up during the xenograft application and the outcome was assessed after the removing of xenograft.

Results: Staphylococcus aureus was seen in 29% (13/45) of patients, MRSA in 7% (3/45) of patients and Pseudomonas aeruginosa in 22% (10/45) of patients. There was a significant reduction of the wound area after treatment with xenografts compared to the initial wound area (8.71 ± 13.54 vs. 25.29 ± 39.57 cm²; $p < 0.001$). The mean xenograft application time was 32.8 ± 20.6 days. Xenografts were early removed in 3 patients (one due to severe ischaemia of the foot, 2 due to progression of infection), no others complications of therapy were seen.

Conclusion: Skin xenografts, a dermal-epidermal grafts taken from pigs, provides another safe and effective grafting option for treating chronic non-healing diabetic foot ulcers including ulcers with mild infection by Staphylococcus aureus and resistant pathogens, which are not suitable for other skin grafting methods.

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