THE CARE AND MAINTENANCE OF THE SCRIBNER TEFLOWN-SILASTIC SHUNT.
EXPERIENCE HOW TO PREVENT INFECTION

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Infection at the site of the arteriovenous teflon-silastic shunt is a serious hazard. Phlebitis and cellulitis affecting the cannula site are frequently complicated by septicaemia which is a great cause of morbidity and mortality in patients undergoing chronic dialysis. This disappointing experience with the silastic shunt has led to the general opinion that infection, besides clotting, is not only a permanent threat but an inevitable event connected with this type of arteriovenous fistula (Stille et al., 1967; Brescia et al., 1966). In our experience, however, the care which is given to the skin and cannulas seems to be a determining factor in the occurrence of infection. The principles of the treatment in our unit are derived from a dermatological point of view, whereas most methods of cannula care which are in use, constitute an effort to follow as closely as possible the rules of a surgical ward. Daily dressing change and hexachlorophene scrubs under aseptic precaution have their origin in the preoperative antiseptic measures of skin disinfection and wound treatment. There is reason to believe that the number of failures often parallels the intensity of such care.

Description of the procedure used in our unit:
1. Macerating disinfectants or detergents are not used. The arm, i.e., the implantation area is only rapidly rinsed with 70% alcohol for cleansing purposes rather than for disinfection. Desquamating skin and residues from previous treatments are carefully removed with alcohol cotton balls.

Fig. 1.

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2. When the area is dry and clean a thick layer of a fatty lanolin ointment is applied to the shunt site and around the whole forearm which is then carefully bandaged. The ointment should cover the points of entrance of the cannulas.

3. The treatment should be carried out after dialysis and not be repeated more than twice a week. Part of the dressing from the previous treatment should remain in place during dialysis. It should allow the connection of the shunt tubes to the blood lines of the apparatus without exposing the skin during dialysis.

The dressing which does not slip with the ointment is a good protection against mechanical trauma and traction during dialysis and in the interval. Stabilizers were found to be unnecessary.
The ointment does not contain antibiotics or antiseptics. It is a mixture of adeps lanae, cetaceum, lanolin, vegetable oils and fermented hydrolysates of milk-proteins, supplemented with the fat soluble vitamins A, E, D and F. This ointment is widely used in baby care. No effort was made to keep it strictly sterile. Aseptic precautions when handling the shunt are now reduced to a minimum which is compatible with the routine work in the unit.

RESULTS

In our experience with 600 dialyses during the past two years, both chronic and acute, neither infection nor inflammation at the implantation site of the shunt has ever been observed. The times of perfect first shunt function in 4 rehabilitated patients are 20, 13, 2, and 2 months. In 5 chronic patients who died after 7, 7, 6, 4 and 3 months no shunt failure or infection had occurred. Clotting was extremely rare. Mild anticoagulation with dicoumarol is used routinely. Antibiotics were given only sporadically for other reasons. The cannula sites remain completely free of irritation and redness, produce no crusts, do not bleed and the subcutaneous channels are deeply epithelialized. Itching seldom occurs. As a whole the skin of the forearm shows a soft and normotrophic condition. The patients use their arm freely and no significant psychological fixation has been noticeable in the absence of complications.

Until now only one complication involving surgical revision of the arterial cannula was encountered because of a bleeding aneurysm which developed in front of the teflon tip.

DISCUSSION

The principles of antisepsis which are successfully applied in surgery seem to be inadequate for the treatment of the external arteriovenous shunt. In pathophysiology of skin infection the high content of free fatty acids, lipids and of wax substances on the skin surface is of great biological importance. The presence of these substances impedes the growth of pathogenic organisms. Not only has the acidity a bactericidal effect but certain acids are known to interfere with the metabolism of bacteria (Gouttron and Schönfeld, 1962). The influence of ointments containing protein hydrolysates on the stimulation of wound healing has been proved experimentally (Heite and Müller-Niewerth, 1958).
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There are no specific skin changes in uraemia, but there is general atrophy of the skin and epithelial organs, e.g., the seborrhoeic glands (Gottron and Schöpfeld, 1962). As a result the natural resistance to infection is lowered by the reduced fat content of the uraemic skin. The repeated maceration of the skin with disinfecting agents, which are good fat solvents, will remove these vital substances and make the skin even more liable to infection. Repeated declotting manoeuvres are often followed by infection. Hence mild anticoagulation which proved to be successful in cutting down the incidence of clotting episodes, seems to us to be justified.

On the other hand, a surprising improvement of the atrophic skin is obtained by the substitution of the skin fats with the aid of a lanolin ointment. Bacteria seem to find a natural barrier at the exit points of the cannulas, as the channels are deeply epithelialized. Histology of the fatal cases mentioned above failed to prove inflammatory signs at the shunt site. Repeated swabs for bacterial culture from the exit points showed no pathogenic organisms.

CONCLUSION

The natural resistance of skin against infection may also be sufficient to keep the cannula site of chronic uraemic patients free from infection. An adequate treatment to maintain the power of self-protection with the aid of a fatty ointment is proposed (Fissan-Vitamin-Hautöl (halbfest), Milchwerke Dr. A. Sauer, Bergstrasse, Zwingenberg, German Federal Republic). The procedure is illustrated in the Figures 1-4.

REFERENCES


