

TISSUE RESPONSE TO CHARCOAL CLOTH IMPLANTED SUBCUTANEOUSLY IN THE RAT AND THE GUINEA PIG

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Introduction

The utilisation of the adsorptive properties of CDE charcoal cloth (1, 2) - a woven, flexible cloth composed entirely of charcoal - have already been examined in one medical application (3). Other potential uses in this sphere may involve the tissue compatibility of charcoal cloth, and this aspect is reported upon here.

Technique and Observations

Rats or guinea pigs were anaesthetised with ether, clipped over the flank and the implantation site washed with ethanol (70%). A 15 mm incision was made with a scalpel as far as the areola connective tissue beneath the panniculus carnosus. A small pocket was opened up between the skin and the body wall by means of a probe and the charcoal cloth, 10 x 5 mm, inserted with sterile forceps. The incision was closed with a dumb-bell adhesive plaster suture. The animals made an uneventful recovery and there were no rejections or infections.

Animals were sacrificed for gross and histological examination for tissue responses to the implants at 2, 6, 14 and 22 weeks.

The implantation site was visible from the lower side of the skin as a slight thickening of the connective tissue. No other gross abnormalities were observed.

The skin was fixed in Bouin's solution, washed, dehydrated, embedded in paraffin wax and 8 μ m sections stained with haematoxylin and eosin and with Masson's Trichrome stain.

The histological appearance of the skin plus the implanted cloth remained almost unchanged from 2 to 22 weeks and in both species amounted to only a very mild response: between and along the fibres of cloth there was a moderate accumulation of macrophages, giant cells, fibroblasts and new collagen fibres, the whole being inserted into and surrounded by the normal subcutaneous connective tissue. There were no lymphocytes, polymorphonuclear leucocytes or eosinophils, and there were no abnormalities in the adjacent muscle layers. These observations will be continued at intervals for a total of two years.

Conclusion

Implantation of CDE charcoal cloth subcutaneously in the rat or the guinea pig has caused no adverse tissue responses over a period of 5½ months.

References

- (1) Adsorptive Properties of CDE Charcoal Cloth, Maggs F.A.P., Smith M.E., and Robins G.A. This Conference.
- (2) Physical Properties of CDE Charcoal Cloth, Maggs F.A.P., Smith M.E., and Robins G.A. This Conference.
- (3) 29th ACEMB; Boston, Mass.; Nov. 1976. Gaylor J.D.S., Maggs F.A.P., Park G.B., and Smith, E.M.