

The Results of Autogenous Tibial Periosteal Transplants for Full Thickness Cartilage Defects in the Knee Joints of Pigs

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Abstract

An experimental study was conducted to demonstrate macroscopic and microscopic healing of full thickness cartilage defects with mature stable hyaline cartilage after autogenous tibial periosteal transplants in the knee joints of pigs.

Similar full thickness osteochondral defects were created in the medial femoral condyles of both knees in 10 healthy young adult pigs. Periosteal transplants were performed on the left knees and the right knees used as controls. The pigs were sacrificed in two groups at 6 weeks and 3 months. The knees were inspected for healing and stability of the graft. Microscopic sections were taken and evaluated using a histological score developed by O'Driscoll.

Macroscopically, almost all defects with periosteal grafts healed with a translucent bluish-white colour indicating articular cartilage formation. There was good restoration of the bony contour and filling of the defects were superior to controls. Histologically, we were able to demonstrate immature hyaline cartilage which matured at 3 months. The newly formed tissue was stable and well-incorporated. It had almost complete bonding to the adjacent articular margin, good reconstitution of the osteochondral junction and a well maintained structural integrity.

We concluded that periosteal transplants in the knee of a pig model healed with mature stable hyaline cartilage.

Ann Acad Med Singapore 1999; 28:8-14

Key words: Hyaline cartilage, Osteochondral defects, Osteochondritis dissecans, Traumatic osteochondral fractures