REPEATED REGENERATION OF A MENISCUS IN THE KNEE

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Experimental work in animals (Walmsley and Bruce 1938) has shown that the menisci of the knee joint can regenerate after surgical removal. There have been several reports of regenerated cartilages in the human knee joint (Mandl 1929, Möller 1930, Fisher 1936, Bruce and Walmsley 1937). Smillie (1944) described the characteristics of the regenerated meniscus. It is in general appearance similar to the normal meniscus but is narrower, thinner and whiter. It is composed of fibrous tissue without cartilage cells. It has a dense attachment to the capsule, and is therefore less mobile than the normal meniscus. Because it projects less into the joint and is more fixed, the regenerated meniscus is less vulnerable to injury. Tears of these fibrous menisci are therefore rare, and are invariably associated with ligamentous damage, which renders the joint abnormally lax.

A search of the literature has failed to reveal a report of regeneration of a meniscus a second time, and the following case, in which a torn lateral meniscus and two torn regenerated menisci have been removed from the same knee compartment in the course of two years, is thought to be unique.

CASE REPORT

A professional footballer aged sixteen twisted his right knee when playing in April 1960. The joint immediately locked and rapidly became swollen. The next day the joint was opened and a peripheral tear of the lateral meniscus was found. The whole meniscus was removed, and, since it bore a haematoma on its torn edge demonstrating the vascularity of the periphery of the cartilage, it was mounted for teaching purposes.

FIG. 1

The three specimens. On the left is the complete lateral meniscus. The peripheral haematoma can just be seen. On the right are the two regenerated menisci: they are thinner and whiter and have longitudinal tears.
The patient made a satisfactory recovery and returned to first class football six weeks later. He played regularly every week for nearly a year, but he then suffered a second twisting injury to the same knee. The joint again locked. A week later a regenerated meniscus with a longitudinal tear was removed from the lateral compartment. Once again recovery was uneventful and the patient returned to professional football within two months. He turned out regularly for his club throughout the next season until in April 1962 the story was repeated. A sudden twisting injury followed by swelling, locking and pain localised to the lateral compartment allowed a confident diagnosis. At a third arthroscopy a second regenerated meniscus with a longitudinal tear was removed (Fig. 1).

Two months later he again returned to professional football and again played every week until pain, swelling and incidents when the knee "gave way" gradually increased. There was no sudden dramatic incident as on the previous three occasions. The instability was felt subjectively in the lateral compartment and tenderness was acute and limited to the lateral joint line. A further exploration was embarked upon with interest. With some surprise and not a little disappointment, we found not the slightest sign of regeneration of the meniscus a third time. The cause of the symptoms was seen to be a lesion in the articular cartilage (Fig. 2).

COMMENT

As stated earlier, a tear of a regenerated meniscus can occur only in a joint which is abnormally mobile. In this case the anterior cruciate ligament was intact but excessively lax. Examination of the menisci confirmed Smillie’s description of them. In reported animal experiments menisci never failed to regenerate. It is clear that in man regeneration of the meniscus is not the rule and there is no obvious reason why this patient did not regenerate a third fibrous meniscus.

Since regeneration of a meniscus replaces a structure with a definite function and returns the joint to near normal, it should be encouraged. To this end total excision of the meniscus leaving no rim of avascular fibrocartilage should be the practice when meniscectomy is performed.

SUMMARY

1. The characteristics of the regenerated knee meniscus are reviewed.
2. A case is reported in which a meniscus twice regenerated and was twice torn.

This patient was under the care of Mr F. W. Holdsworth, to whom I am grateful for permission to publish this report.

REFERENCES


Walmsley, R., and Bruce, J. (1938): The Early Stage of Replacement of the Semilunar Cartilages of the Knee Joint in Rabbits After Operative Excision. Journal of Anatomy, 72, 260.