

mass is seen. In the connective tissue undergoing metaplasia homogenization of the distribution of the mass was apparent. This may be accounted for, on the one hand, by the increase in the mass of the ground substance, on the other by the breaking up and merging with the ground substance of the mass of the connective tissue fibrils.

The new metaplastic cartilage showed no appreciable tendency to ossification.

The authors concludes that the autogenous whole-thickness skin graft with subcutaneous fatty tissue is eminently suitable as interposition material. The epidermis of the skin is destroyed by the weight and function of the joint and the connective tissue acting as interposition material undergoes functional metaplastic development into cartilage. If no interposition material is used, articular weight and function tend to destroy the granulation tissue growing from the freshened articular surface so that in these cases the articular surface consists of naked bone.

ERKKI KALLIO: Skin Arthroplasty of the Hip Joint and Corresponding Alloplastic Methods in the Light of a Clinical Study.

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Ejnar Munksgaard, Copenhagen 1958

(Author's Abstract)

The object of this work was to investigate the results obtained with a new method of arthroplasty in which whole-thickness skin with fatty tissue is used as interposition material, and which has been developed in the Orthopaedic Clinic of the University of Helsinki. Follow-up examinations were simultaneously made of the patients on whom alloplastic hip arthroplasty had previously been performed in the Clinic. Since furthermore nearly all the operations had been performed by the same surgeon, this provided a good opportunity to compare the results of the recent skin arthroplasties with those of the earlier vitallium cup and endoprosthesis arthroplasties.

After a survey of the literature on arthroplasties the writer reviews the publications dealing with the use of skin for this purpose. Skin was used already earlier as an interposition material in arthroplasties but the data on these isolated cases is limited almost to brief references only. Following a chapter describing the statics and mechanics of the

hip joint the writer gives a report of his investigation. The series studied comprised all the hip arthroplasties performed in the Clinic during 7 years. In this period 171 arthroplasties were made on 163 patients, 103 of whom were women and 60 men. The oldest patient was 77 years and the youngest 12 years of age. The same surgeon performed 158 of the operations and the remaining 13 operations were made by four surgeons. The cases were distributed according to the type of arthroplasty as follows: 35 cases of vitallium cup arthroplasty, 83 cases of endoprosthesis arthroplasty, and 53 cases of skin arthroplasty. In 160 cases the indication of the operation was osteoarthritis, which in 84 cases was primary and in 76 cases secondary.

The follow-up examinations of these patients were made from 7 years to 1 year after the operation. A total of 94 per cent of the patients answered a questionnaire sent to them by the writer, and in addition 83 per cent arrived for a personal follow-up examination. The mean length of postoperative hospital treatment in the total series of 171 arthroplasties varied from 5 to 6 weeks in the three arthroplasty groups. The least number of complications during this period occurred in the patients with skin arthroplasty, in whom the incidence was 11.3 per cent. There was no case of infection in this group. The endoprosthesis group included the only fatal case in the series, in which thromboembolism caused the patient's death 3 weeks after operation. Postoperative complications occurred in 15.6 per cent of the patients in this group, whereas in the vitallium cup arthroplasty group they occurred in 22.8 per cent.

Independent of the method of operation used, two-thirds of the patients stated that they were either satisfied or very satisfied with the result. An affirmative reply to the question whether the new joint felt natural was given by 81 per cent of the 52 patients with skin arthroplasty, 60 per cent of the 75 patients with an endoprosthesis and 44 per cent of the 34 patients with a vitallium cup who replied to the questionnaire. Work had been resumed on the average 6 months after operation. Nearly all the patients had resumed their previous occupation, a few young patients had learned a new occupation, and some of the older patients were pensioned.

Absence or definite relief of the preoperative pain was reported by 62 per cent of the skin arthroplasty group, 65 per cent of the vitallium cup group, and 87 per cent of the endoprosthesis group. The mobility of the hip joint was studied in the light of Gade's mobility index figures. Approximately the same mobility value was found in the three groups of

patients at the follow-up examination independent of the preoperative mobility of the joint. In cases in which the hip before operation had been quite stiff it was after operation as mobile as the hips which initially had better movement. In the latter cases the mobility had not notably increased. The movements of the hip joint when the patient began weight-bearing improved slightly in the course of one year but then remained practically unchanged. The increase in the mobility was very similar in the three types of arthroplasty, the initial mobility being about doubled. The increase was 24.7 in the skin arthroplasty group, expressed in Gade's mobility index figures, 22.7 in the vitallium cup group, and 25.9 in the endoprosthesis group. Trendelenburg's symptom was positive at the follow-up examination in only 6 per cent of the patients.

In the patients with skin arthroplasty no new osteophyte formation was seen in the femoral head, and in only 4 cases they had developed on the rim of the acetabulum. After vitallium cup and endoprosthesis arthroplasties there was marked formation of osteophytes. In about every fifth patient with skin arthroplasty the joint space had become more distinct during the first year after operation. It is regarded as possible that also on man the skin under favourable conditions may, due to function, develop into metaplastic cartilage, as has been shown by Kettunen in animal experiments in our Clinic. It was an interesting observation that a control roentgenogram in which the hip joint appeared unfavourable did not always signify an unsuccessful arthroplasty. Clinical experience definitely indicates that whole-thickness skin may safely be used as interposition material and that there is every reason to develop arthroplasty further on this biological basis. However, the interposition material as such is only one of many factors influencing the results of an arthroplasty.