K. STENPORT:

A CASE OF ARTHROPLASTY ON THE HIP-JOINT AFTER SMITH-PETERSEN

At the Congress of the Scandinavian Orthopedic Association in Oslo in the summer of 1939, Smith-Petersen presented his material on arthroplasty on the hip-joint in a lecture to which a great deal of attention was paid. The substance he had arrived at as the best for the caps which he placed on the head of the femur, is vitallium. This form of arthroplasty seemed very attractive, indeed, and I decided to try the operation when a suitable case presented itself, as technically it is easier than the previously prevailing method for arthroplasty with covering of the remodelled head of the femur with a coat of the fascia lata. Such a suitable case offered itself on April 21, 1941.

This was the case of a girl, 14 years old who was fullgrown at that age. Three other children in the family had died of tuberculosis, including one with tuberculosis of the hip-joint. Our patient had not been in contact with her sibs, however. Her mother died of puerperal sepsis. Otherwise the family history is of no interest. Prior to her present illness the patient had always been well. She had never suffered from any epidemic disease or severe angina.

In April 1939 she had some pain in the left hip-joint for about a week, and she limped. She knows of nothing that may have given rise to this trouble in the hip. Since then, she has had periods of increasing discomfort in the hip at shorter and shorter intervals. Gradually this trouble became constant, and rest gave her no relief. She was then admitted to the Hässleholm Hospital, where she was treated under the diagnosis Perthes' diesase with traction for 4 months, in 1940. The Mantoux test was negative with 1:100; and the sedimentation rate was normal.

There was a marked reduction in the mobility of the hip-joint, and roentgenography showed a very narrow joint slit. Her condition improved under traction treatment, but when she got op, her hip became more stiff again.

She was admitted to the Orthopedic Clinic in Hälsingborg on 29/4/41.

Examination of the left hip showed: Flexion contracture of 45°; in addition, 10° adduction. The mobility was practically abolished, only rocking movement being practicable. Any attempt at somewhat forced passive motion gave marked pain in the joint. The circumference of the left thigh, measured at the middle, was 3 cm. less than the right. No tenderness directly or indirectly over the joint. She walked with greatly increased lordosis and with a typical hip limp. Trendelenburg was positive. Pirquet and Mantoux, 1:100, negative. Sedimentation rate: 10 mm./1 hr.

The roentgenograms show a very narrow joint slit, no demonstrable decalcification of the head of the femur. No induration of the bone. Configuration of the bone good. Head of the femur somewhat flattened and more bulky than normally. Any present infectious process could be excluded, but no definite diagnosis could be made. I was inclined to ascribe the marked reduction in cartilage to a nutritional disturbance, possibly due to a vascular injury or failing function in the ligamentum teres.

On May 17th, 1941, arthroplasty with vitallium cap on the head of the femur was performed after Smith-Petersen's method. Ollier's great trochanter incision was made. The trochanters with apertaining muscular insertions were sawn off with Gigli saw. The capsule was opened longitudinally in its anterior lateral part, and the head of the femur was dislocated with considerable difficulty. The cartilage of the head as well as that of the acetabulum had undergone marked changes and atrophy. The ligamentum teres or remnants of it could not be made out. The head was chiselled to fit into the vitallium cap, which was fixed by bending the margin of the cap in so that it gripped the bone.

After this the cap fitted firmly. The bony tissue of the head was somewhat porous and spongy. There was no induration of

the bone. Then the head was placed in position again and the capsule was sutured. The tip of the trochanter was fixed in place with strong silk suturess. A large hip plaster cast was applied with the hip in slight flexion and abduction. The operation took 1 hour. Histological examination of the chiselled fragment showed normal structures of the bone without any sign of inflammation. The articular cartilage presented some small areas of the so-called asbestos degeneration. (Sjövall.)

The operation thus verified my assumption of a nutritional disturbance as the cause of the reduction in cartilage—that is, if the nutrition of the head of the femur to some extent proceeds through the ligamentum teres. Two weeks later the plaster cast was cut open and treatment with passive motion and massage was instituted. After two months the patient began to walk in a go-cart.

Now, 4 months after the operation, the patient walks about without any cane but with a slight limp. Trendelenburg slightly positive. The patient has no pain nor any other complaint.

Examination of the hip-joints shows:

	Left	Right
Flexion	60°	100°
Abduction	30°	60°
Outward rotation	20°	40°
Inward rotation	15°	30°

The condition of the patient prior to the operation, the operation itself and the post-operative course have been filmed.

An ordinary semispherical bowl will easily slip on the underlying structnre, of course, and thus involve a risk of a condition corresponding to epiphysiolysis. In order to counteract this I have tried to bend the edges of the cap inwards so that they grip the bone. Another way of securing this firmness would probably be to elongate this semispherical bowl cylindrically by 1 cm. so that it would encircle a small part of the neck of the femur.

(Demonstration of the patient and presentation of the films.)

DISCUSSION

Waldenström, H.:

On my visit to America in 1938 I had an opportunity to see Smith-Petersen operate, with employment of his cap. He was kind enough to gather several other patients he had operated on, in order to show me the results, which were very good. He also showed me a patient who had been operated on three weeks before and now without any pain was riding a bicycle constructed by Smith-Petersen—it was fixed to the floor in such a way that the back wheel offered a varying resistance to the rider (an exellent exercise for the hip!). At that time Smith-Petersen was of the opinion that the cap ought to be taken out after some years. I also saw him perform such an operation. At that time he used glass or bakelite for the cap. But as glass breaks rather readily he has now gone on to use vitallium and he no longer takes the cap out afterwards.

As yet we do not know how such a shell that articulates against the acetabulum as well as against the head of the femur will be tolerated in the long run. Arthroplasty with the fascia lata has given fairly good results, indeed and it does not seem rational to give up this method of treatment in ordinary cases before some more experience has been gained from the cap operation. One advantage, which Smith-Petersen pointed out, and I had occasion to observe in his clinic, was the freedom from pain during the after-treatment. Cases with bony ankylosis, in which the joint, so to speak, has to be chiselled out of the pelvis, are particularly troublesome on account of the long and painful after-treatment. I have employed the vitallium cap in 2 cases of this category with bilateral ankylosis of the hip. How the final result will turn out is still too early to judge yet. One of these patients was operated on two months ago, the other 4 months ago. The painfulness of the after-treatment was about the same as after arthroplasty with fascia lata covering. Quite recently I operated on a man of 65 years with arthritis deformans and immobile hip-joints with the legs crossed. He was thus positively unable to get along by himself. In his case, too,

I employed the cap method because it is less trying on an old man. He stood the operation very well.

For the present, then, till we have gained more experience in this respect, I have limited the employment of the cap method to certain selected cases.

Sten Friberg:

In the case reported by Dr. Magnusson, operated on by me, I have to admit unfortunately that the result 4 months after the operation is the same as before. Dr. Magnusson has been kind enough to ascribe this to the method employed. It is not improbable, however that the unsatisfactory result is due in part to the way in which the operation was performed.

In the cases operated on by me, I found the Smith-Petersen caps to be rather large; and it has been difficult to find a sufficiently small cap, suitable for the head of the femur. As far as that goes the poor result may be attributable to the method. It is very likely, however, that the result was so poor because I did not make the acetabulum wide enough for the cap. In the case described by Dr. Magnusson I was afraid to obtain a tendency to dislocation and on that account I made the acetabulum very narrow in proportion to the convexity of the cap. This is evident, I think, from the post-operative roentgenograms.

I think, therefore, Dr. Stenport was on the right track when he formed the cap after the head of the femur and let the entire motion take place between this cap and the acetabulum. Undoubtedly it would be better to make the caps somewhat smaller because the anatomical conditions are not always suitable for the creation of an acetabulum that allows of good mobility and yet ensures against dislocation or subluxation with the rather large caps now available.

A good deal of pessimism concerning this method has been expressed in this discussion; I do not think it is justified, and at any rate it is too early to reject this method on the basis of our very limited experience so far.

Orell, S.:

I have had accasion to treat two patients with arthroplasty with the cap method: One was a man, aged 36, with bilateral arthritis deformans of the hip-joint together with coxa vara on the side most affected, on which the operation was performed on 10/12/1940. The other patient was a woman, aged 41, with arthritis deformans of the right hip on which the operation was performed on 4/10/1940.

In both cases the mobilizing treatment commenced about two weeks after the operation and made rapid progress as long as the patients were confined to bed. When they commenced getting up the troubles increased, and there was increased tenderness of the joint on movement and on walking. When the patients then were kept in bed, their complaints again subsided within a couple of days. In the first case, the discomfort increased in such a degree that I had to remove the cap in July 1941. After this, the discomfort in the hip-joint has decreased and the mobility has increased quite considerably. In the other case the cap is still left in place but the mobility is still reduced considerably and the patient has to use a cane when she walks.