DISCUSSION

G. Odelberg-Johnson, Vejbyslätt:

My experiences in operations with employment of os purum and os novum have not been so favourable as those reported by *Risinger*. In one case where the Albee operation was carried out with os purum and os novum no union was obtained in the upper half of the operative field. The upper half of the os purum bridge failed to unite with the bone of the spinal column and was embedded in a membrane of connective tissue. In another case where I performed the Albee operation merely with a bridge of os novum a rapid healing was obtained in the area of transplantation, but the observation period in this case has been too short for an estimate of the final result.

In two cases of tuberculosis of the joints between the navicular and cuneiform bones, I filled the resection defect with os purum spongiosum. In one case I obtained absence of symptoms and good function; in the other the os purum was discarged after 1½ years.

In resection of the knee-joint it is essential to avoid an extensive resection of the articular ends of the bones, and foci in the bones should be chiseled out deeply. It is not necessary to fill these defects, as consolidation is obtained anyhow within 6—12 months.

As a rule, sacro-iliac tuberculosis is so benign that operative treatment is required only in exceptional cases.

P. G. K. Bentzon, Aarhus:

The comprehensive experiences presented by *Risinger* concerning the os novum method for autoplastic bone grafting are most interesting, inviting very urgently to take up this method. As yet I have had no occasion to try it.

I should like to know how *large* transplants of os novum *Risinger* thinks it may be possible to obtain. I ask this question on account of a transplantation of bone for spondylolisthesis that I performed some months ago, and which required a strong transplant measuring about 24 cm. in length. As I have not been able in the literature to find any report on similar opera-

tive treatment for spondylolisthesis, it may perhaps be appropriate here to report this case even though the observation period has been too short to allow of any estimate of the final result of the operation.[1])

The patient, a farm-hand, was 19 years old when he entered the Orthopedic Hospital of Aarhus on January 25, 1937. He gave a past history of otherwise good health, stating that the affection of his back developed in March 1934 after a fall down a stairway that gave him a severe pain over the lower part of the loins, and he was unable to get up by himself. He was brought to a country hospital where he stayed 1½ months—where no signs were found of any fracture of the spinal column. Since his discharge from the hospital he has been unable to work on account of pain around the lower part of the lumbar column.

On examination the patient looked perfectly healthy, presenting no abnormality apart from his complaint concerning the spinal column. In particular, his gait was normal, but he was able to walk only a short distance on account of pain in the back, and the pain also increases at the sacrolumbar junction when he is sitting for any length of time.

On inspection of the back it is easy to make out, also without roentgenography, a pronounced spondylolisthetic displacement of the lumbar column in relation to the sacrum, as there is a deep depression corresponding to the lower part of the lumbar column, and the inclination of the pelvis is considerably less than normally. Roentgenography shows an unusually pronounced degree of spondylolisthesis between L.V and S.I, as the body of L.V. has slid down past the first sacral segment, so that it is lying "free" in the small pelvis in front of the sacrum. The displacement of the spinal canal resulting herefrom was so marked, that it was really surprising that no nervous symptoms had appeared. It is true that the tendon reflexes might be designated as rather lively (no clonus or Babinski reflex), but apart from this no abnormalities could be made out, especially no disturbances of the sensibility.

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[1]) Addendum in the proof: The course has been quite uncomplicated since. The patient, wearing a leather corset, is moving about without any pain whatever, and he is now a tailor's apprentice.

As the patient had to be regarded as markedly disabled, an attempt at operative treatment was indicated. Temporarily the patient was given a plaster cast involving the back and both thighs too, and on March 9, 1937, when he had got used to rest in this cast, an *attempt* was made at a regular Albee operation from the sacrum to the lumbar column. After the spinous processes of the lumbar vertebræ and the upper part of the sacrum were uncovered, however, it was found impossible to make a suitable bed for an Albee transplant without eventual projection of the transplant into the spinal canal and the cauda equina. The lumbar column was displaced anteriorly to such an extent that the *posterior* margin of its spinous processes was *anterior* to the sacral canal, corresponding to the first sacral segment, where the dura was found to make a bayonet-shaped bend over the body of the first sacral segment, completely uncovered as far as any bony arch was concerned. Under these circumstances an Albee transplant would have to get a peculiar shape (somewhat like a bayonet) in order to establish a connection between the posterior surface of the sacrum and the spinous processes of the lumbar column. If it might have been possible at all to obtain and insert such a transplant, it certainly would have been sure sooner or later to exert a pressure upon the unprotected elements of the spinal cord in the upper end of the sacral canal. So I had to give up the idea of an Albee operation and consider some other way of treatment.

The result of these considerations was the following operation performed on April 3, 1937: Under ether anæsthesia, a transverse incision, arching upwards, was made over the lower part of the lumbar column, extending from the right iliac crest to the left. The lateral surfaces of the spinous processes of L.III and L.IV were laid bare and (with chisel and Luer's boneforceps) notches were made in the lower edge of L.III and the upper edge of L.IV, denuding the bony tissue in this way and forming a wide passage between these two spinous processes, (the supraspinal ligament between the two spinous processes was left intact). By means of a hollow chisel grooves were made in the iliac crests in a line with the interspace between the spinous processes of L.III and L.IV. Corresponding to this

line, tunnels were made bluntly through the musculature, and a model of the required transplant made of sterile lead plate was introduced in these tunnels, so that the form and size of the transplant could be determined precisely—the thicker middle part was to be wedged firmly between the two spinous processes while the slender ends were to rest in the grooves on the

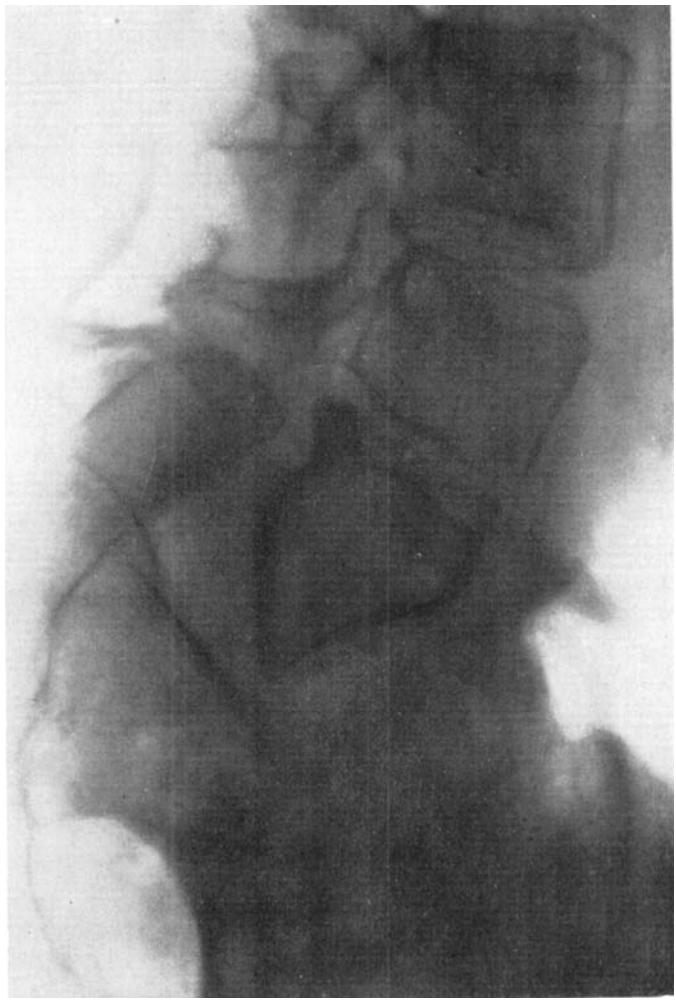

Fig. 1.

iliac crests. Corresponding to this lead model a transplant was cut out with Albee saw from the corticalis of the subcutaneous surface of the tibia, the transplant corresponding precisely in form and length to the model, so that it could be inserted easily into the bed already formed, connecting the iliac crests with the

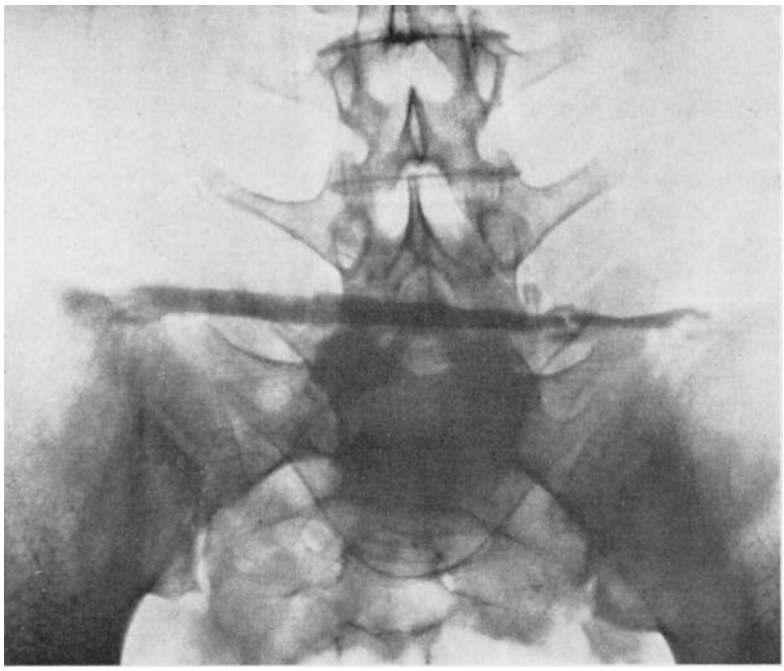

Fig. 2.
4 months after the operation.

spinous processes. Suturing of the fascia and skin. Then the patient was placed in his plaster cast.

Of course, this is no small operation. The transplant measured about 24 cm. in length and, on the middle, about 3 cm. in width. Apart from this, the operation could not be said to be difficult, and the hæmorrhage from the incisions in the back was minimal; the hæmorrhage from the tibia was about the same as usual when a large transplant is taken out of this bone.

From the roentgenograms (Figs. 1 and 2) one might perhaps

get the impression that the comparatively thin beam of bone here transplanted would have to carry all the overlying part of the spinal column in order to prevent any further spondylolisthetic displacement. This, of course, it will not be able to do—nor is it expected to do so. For one thing, we have to reckon that the transplant is supported fairly well also in those places where it lies in the musculature. In the next place, it does not have to carry the vertebral column but merely form a stop for the *forward*-sliding component in the spondylolisthetic skidding. The action of the transplant will be approximately that of the bills of an anchor, and embedded elastically in the musculature. It is to be added that the operation implies the rational factor that the fixation covers columnar elements which are proximal to the "insufficient" lumbar vertebra (L.V).

Walter Risinger, Borås:

Odelberg-Johnson thinks that tuberculosis of the sacroiliac joint always is so benign that it does not require operative treatment. But as it is desirable in such cases essentially to cut down the stay in the hospital I think that operative treatment of the kind I have described means an advance in the proper direction. It is as yet too early to say anything about the final results, but I have an idea, that if only secondary infection can be avoided, the healing might also turn out to be permanent. In two of my cases I have obtained primary healing even though I met with abscesses; these abscesses were scraped out thoroughly before they were filled.

When a very long bone bridge is required as in the case reported by *Bentzon,* it is not necessary at all first to implant this long splint upon the tibia for production of os novum. The thing is then to implant two splinters of os purum spongiosum on the tibia and thus obtain a sufficient amount of os novum which later may be transplanted into the tunnel together with a new long bridge of os purum.

HENNING WALDENSTRÖM, STOCKHOLM:

COXA MAGNA-VALGA-LUXANS

(abstract is not submitted).