Improvements in Total Hip Prosthesis Implantation Technique

A Cement-Proof Seal for the Lower Medullary Cavity and a Dihedral Self-Stabilizing Trochanteric Osteotomy

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Summary. The anchorage of the femoral component of a total hip prosthesis can be improved by the following two refinements to the surgical technique:

1. The femoral medullary cavity is plugged with a bone core taken from the excised femoral head or with a polyethylene bung. The plug prevents the bone cement from being displaced distally into the lower part of the medullary cavity. It contains a small hole through which blood can escape, thus preventing the latter from accumulating in the upper part of the medullary cavity and impairing the bond between the cement and the bone wall of the cavity.

2. The greater trochanter is no longer sliced off with a single cut in one plane but is now removed by dihedral osteotomy, i.e., by making cuts in two planes which intersect each other so as to form a ridge. On compressing this osteotomy by tension band fixation all movement between the fragments is eliminated, including that in the parasagittal plane which results from flexion and extension of the hip. In this manner loosening and pseudarthrosis of the osteotomy are prevented.

Endoprosthetic replacement of the hip joint poses numerous problems. These include the anchorage of the femoral component and the fixation of the osteotomized greater trochanter, two problems for which numerous technical solutions have been suggested.

A wide variety of implants and fixation techniques has been recommended for the prevention of loosening and fatigue fracture of the stem of the prosthesis. Some of them include the use of bone cement and others do not. The methods which have been suggested for the prevention of pseudarthrosis following osteotomy of the greater trochanter range from omission of the osteotomy altogether to a broad spectrum of trochanteric fixation techniques.

For almost 18 years we have been involved with prosthetic replacement of the hip joint in all its aspects and have accumulated considerable experience on the subject. In this paper we should like to acquaint our colleagues with our surgical solutions to the two problems mentioned above.

Damit der erwünschte Kontakt durch eine Blutschicht nicht behindert wird, sind die Pfropfen axial durchbohrt, so daß Blut und Spülfliessigkeit, nicht aber Zement, nach distal in den weiten Markraum weichen können.

1. Cement-Proof Sealing of the Medullary Canal of the Femur

If the femoral component of a hip prosthesis is found to be loose it may well be that its stem was never stably fixed in the femoral medullary cavity. The closer the fit between the stem of the prosthesis and the wall of the medullary cavity the longer is the fixation likely to last, irrespective of whether bone cement is used. If cement is used care should be taken to ensure that the soft cement mass is not pushed down into the distal part of the medullary cavity during introduction of the prosthesis. This would prevent it from being pressed into the surrounding bone by the prosthesis stem and compromise the stability of the anchorage right from the start. In order to prevent this downward displacement of the cement Indong et al. (1978) close the lower part of the medullary cavity with a cement plug. However, in our experience total closure of the medullary cavity in this manner is not without its risks, since the blood which accumulates above the plug may be forced up between the cement and the bone around the inside of the medullary cavity and thus prevent direct contact between the two layers. This would also tend to decrease the stability of the...