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Hip replacement in obese patients

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In a 5-year follow-up study of 125 hip replacements a. m. Lubinus, 41 obese and 84 nonobese patients were compared. Peroperative blood loss was greater in the obese patients. There was, however, no difference in the operation or hospitalization times between the compared groups. There was no infection, wound dehiscence, or delay in wound healing. No deaths occurred during the immediate postoperative period. The obese patients had a lower preoperative walking-ability score. At follow-up, this difference was eliminated. Radiographic signs of loosening were equally common in the compared groups. Three patients, two of whom were in the nonobese group, had been reoperated on because of prosthetic loosening.

Our results indicate that obesity does not increase the risk of surgical complication or prosthetic loosening in hip replacement.

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Introduction

The incidence of surgical complications has been reported to be increased in obese patients (Feinstein & Habermann 1977, Strauss & Wise 1978, Surin 1983), and weight reduction before hip replacement has been recommended (Larsen & Sørensen 1980). We have studied surgical difficulties, postoperative complications, and prosthetic loosening following hip replacement in obese patients.

Patients and methods

During a 2-year period (1979–1980), 141 primary Lubinus arthroplasties were performed in 131 patients at our department. At follow-up after at least 5 years, 6 patients had died, 3 could not be traced for clinical evaluation, and in 4 patients the preoperative weight had not been recorded. Nevertheless, these 13 patients were included in the assessment of immediate postoperative complications. Another 3 patients were excluded form clinical evaluation because they had undergone revision arthroplasty. Hence, 125 hips were available for long-term clinical evaluation; the mean age at follow-up was 70 (28–89) years.

The weight and height of the patients were assessed on the day of admission and at follow-up. A weight index, expressed as the percentage of normal weight for the height and sex concerned (Lindberg & Natvig 1956) was calculated according to the formula:

men: $\text{weight} \times 100/(59.7 + ((\text{height} - 160) \times 0.71))$
women: $\text{weight} \times 100/(52.4 + ((\text{height} - 150) \times 0.67))$

The patients were categorized into two groups according to the weight index before operation: A, <120 per cent; B, >120 per cent. Forty-one patients (33%) were in Group B. The mean weight index was 102 (64–120) in Group A and 134 (120–175) in Group B. Furthermore, the patients were divided into two groups according to body weight only: <80 kg or >80 kg. The latter group included 30 patients (23%). The mean weight was 65 (36–80) kg and 88 (80–102) kg.

All the operations, under general anesthesia, were performed by the same surgeon (not one of the authors). The conventional Lubinus prosthesis with a collar and a curved stem was inserted by a posterolateral approach and fixed with gentamicin-impregnated radiopaque PMMA. The wounds were closed in layers with Mersilene® in the fascia and subcutis and with Prolene® in the skin. Two suction drains, one superficial and one deep, were used. Benzylpenicillin was given from the day of operation until removal of the sutures, and the anticoagulant phenprocoumon (Marcoumar®) was given until discharge. All the wounds were inspected 12 days after operation. As a rule, the patients were mobilized on the third postoperative day.

The clinical assessment of the series included peroperative blood loss, operation, and hospitalization time, pain, and walking ability according to Charnley's scoring system and radiographic analysis.

The radiographic evaluation was done by one of the authors (KS) and was based on the zonal analysis described by Gruen et al. (1979). Cementation was defined as adequate if all the cancellous bone had been removed and/or the thickness of the cement mantle was at least 2 mm. Special attention was focused on progression in width of radiolucent zones and stem migration. The hips were classified as being not loose, possibly, probably, or definitively loose according to

Harris et al. (1982). Finally, femoral stem orientation was assessed as neutral, valgus, or varus. The statistical significance between differences was evaluated by the Yates corrected chi-square test and by an analysis of variance.

Results

Peroperative blood loss was greater in the obese patients (Table 1). There was no difference in operation or hospitalization time between the compared groups. Two nonobese patients developed wound hematomas, which were aspirated. However, no infection, wound dehiscence, or delayed wound healing occurred. Two deep venous thromboses and one minor pulmonary embolism were diagnosed and successfully treated with anticoagulants. One patient had transient sciatic palsy.

The obese patients had a lower preoperative walking ability than the nonobese patients, but not postoperatively (Table 2). As to preoperative and postoperative pain, there was no difference between the compared groups. Loosening of either the acetabular or femoral component necessitating reoperation occurred in three hips, two of which were in the nonobese group.

Radiographic analysis (Table 3) disclosed no relationship between weight and signs of loosening. Overweight was correlated with calcar resorption >1 mm, but not with that >3 mm. Both calcar resorption and signs of loosening were related to varus stem orientation ($P<0.01$ and $P<0.001$, respectively). There was no correlation between overweight and stem orientation. There was one cement fracture, but no prosthetic fracture. Considerable heterotopic ossification was noted in 15 cases, but was not correlated with weight. The distribution of cement did not differ between the compared groups.

Table 1. Blood loss (ml), operation time (min), and hospitalization time (days)

	Weight index			Weight		
	<120	>120		<80	>80	
	n84	n41	P	n95	n30	P
Blood loss	527	674	0.02	525	737	0.02
Operation time	90	91	NS	89	93	NS
Hospitalization	16	15	NS	16	14	NS

Table 2. Pain and walking ability. Charnley's scoring system

	Weight index			Weight		
	<120	>120		<80	>80	
	n84	n41	P	n95	n30	P
Pain						
Preop.	1.6	1.6	NS	1.7	1.6	NS
Postop.	5.7	5.8	NS	5.7	5.8	NS
Walking ability						
Preop.	2.3	1.8	<0.05	2.2	2.2	NS
Postop.	5.0	4.9	NS	4.9	4.8	NS

Table 3. Radiographic analysis

	Weight index			Weight		
	<120	>120		<80	>80	
	n84	n41	P	n95	n30	P
Stem orientation						
Neutral	54	24	NS	59	19	NS
Valgus	7	4	NS	7	4	NS
Varus	23	13	NS	29	7	NS
Calcar resorption						
>1 mm	49	33	0.01	59	23	NS
>3 mm	18	9	NS	21	6	NS
Loosening						
None	66	27	NS	70	23	NS
Possibly	15	11		20	6	
Probably	2	1		3	0	
Definitively	1	2		2	1	

Discussion

Surgery in obese patients has been reported to be associated with an increased incidence of complications (Strauss & Wise 1978). This has partly been attributed to technical difficulties causing prolonged operations, greater blood loss, and wound-healing problems. In hip replacement, obese patients have been claimed to be at an increased risk of sustaining late prosthetic loosening and fatigue stem fracture (Hierton et al. 1983, Wroblewski 1982).

In our study the only variable showing a difference between obese and nonobese patients was peroperative blood loss. The greater blood loss in the obese patients was not related to operation time, but may be explained by an increased intrathoracic pressure during artificial ventilation causing increased venous oozing (Modig & Malmberg 1975). The fact that no difference in thromboembolism was found between the compared groups does not refute that obesity is a predisposing factor, as has been reported by others

(Postlethwait et al. 1972), which may partly be explained by the relative immobility of obese patients leading to stasis in the lower limbs. Thus, it must be emphasized that the diagnosis of postoperative cardiovascular complication entirely was based on conventional clinical signs. Nevertheless, it is interesting to note that the obese patients were mobilized and discharged at the same time as the nonobese patients.

As opposed to reports on obese patients undergoing intraabdominal surgery (Strauss & Wise 1978), we found no wound dehiscence or infection. One reason may be that technical difficulties did not prolong the operations; another may be the consistent use of effective wound drains. The most important factor, however, is probably that the risk of bacterial contamination of the surgical wound is less in THR than in intraabdominal surgery.

Radiographic analysis – including evaluation of stem orientation, calcar resorption, and loosening – disclosed no difference between the compared groups. Because these radiographic features have been shown to be of relevance for predicting failure of THR, there are reasons to assume that the need of rearthroplasty in obese patients will not be greater than in nonobese patients even in the long run. This, however, can only be proved by longer follow-up studies.

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