Obesity and joint replacement

There has been considerable discussion as to the influence of obesity on the indications for, and the outcome after, joint replacement. Attempts have been made to withhold funding for such procedures in those who are overweight. What is the justification for this? This editorial examines the current evidence concerning the influence of obesity on joint replacement and suggests that it is only in the morbidly obese, with a body mass index > 40 kg/m\(^2\), that significant contraindications to operation are present.

In the early days of hip replacement, obese patients were often told to lose an appropriate amount of weight prior to the operation. The reason for this was that it was believed that the morbidity in patients who were overweight was greater than in those whose weight was normal. The surgeon did not wish to undertake the increased physical and technical labour of operating on such individuals, and it was a useful way of managing a long waiting list. It has since become the custom not to deny these patients an early operation since it has been appreciated that obesity does not greatly influence outcome. However, recently a Health Authority in the east of England proposed not to fund hip replacement in patients whose body mass index (BMI) exceeds 30 kg/m\(^2\), which is accepted as the level at which a person who has been considered to be merely overweight is defined as obese. Other funding bodies have considered similar action. These authorities are seriously overspent and see this as one of the measures which they might take to reduce their expenditure, since they need to ration their services. Irrespective of the moral issues involved in withholding treatment from patients requiring joint replacement within the National Health Service because of the inability to control costs, the question should be asked if there are reasonable medical grounds which may justify this position. Are obese patients at greater risk? Do they have a worse outcome?

Obesity may influence the development of degenerative changes in the hip, affect the conduct of the operation, compromise the early post-operative phase and influence the functional outcome. Difficulties arise in the interpretation of the literature because of the varying definitions of obesity. However, problems of mobilisation and of the functional outcome do not appear to become apparent until a BMI in the region of 40 kg/m\(^2\) is encountered. There is strong evidence to suggest that obesity is a factor in the development of osteoarthritis of the hip, particularly in those with a high BMI in early adulthood. With the apparent increase in obesity in the developed world this can only be counteracted by greater education so that patients can appreciate their ability to influence their own health. In extreme cases some have advocated the use of bariatric surgery before proceeding to joint replacement in order to bring the weight of the patient down to an acceptable level. One of the principal reasons for advocating weight loss before operation for hip replacement has been the belief that the technical aspects of the procedure may be more difficult and that the risk of complication during and after surgery is greater. However, published evidence does not support this view. In this issue of the Journal, a study by McLaughlin and Lee compares the results of a series of cemented hip replacements in patients with a BMI greater than 30 kg/m\(^2\) with a similar number with a mean BMI of 26 kg/m\(^2\). They were observed for a mean of 14.6 years. There was no difference in the incidence and degree of peri- or post-operative complications and the functional and radiological appearances at the final follow-up were similar. Perka et al have observed an increase in operating time in obese patients, but found no other statistically significant difference in per-operative morbidity and mortality compared with those of non-
obese patients. Bowditch and Villar\textsuperscript{12} noted an increase in peri-operative blood loss in patients with a BMI greater than 30 kg/m\textsuperscript{2} compared with those in whom it was lower, this was also noted by Soballe et al.\textsuperscript{10} However, neither of these groups thought this to be more than a minor concern and they, and others,\textsuperscript{9,11} did not find that there was an increased risk of surgical complications or loosening in obese patients.

Obesity has been generally held to increase the risk of venous thromboembolism,\textsuperscript{13,14} although with effective prophylaxis this should be negated.\textsuperscript{15}

The view has been expressed that the functional result after hip replacement in the obese is impaired\textsuperscript{16} indicating, perhaps, that the procedure should be reserved for the slimmer candidate. It has been suggested that there is a greater risk of loosening or fracture of the femoral component, but the evidence is not convincing, and there are no long-term studies of sufficient statistical strength to support this view. Indeed the paper by McLaughlin and Lee\textsuperscript{8} shows no difference in such outcomes between the obese and non-obese. Body-weight has not been shown to have a consistent effect on the rate of wear of polyethylene. Wear has been shown to be a function of use and since the obese tend to have a lower level of activity, their increased weight is unlikely to affect the wear characteristics of the acetabular component.\textsuperscript{16}

Studies assessing the outcome of hip replacement have shown no statistically significant difference in scores between obese and non-obese patients.\textsuperscript{3,17,18} The improvement in function and satisfaction with the outcome are similar in both groups.\textsuperscript{3,17,18} There is no justification for denying a hip replacement to a patient with disabling arthritis solely because of obesity.

Now what of the knee? Here again the interpretation of the published articles concerning the outcome in patients who are overweight is difficult because of the uncertainty of some of the definitions used. There is strong evidence to suggest that obesity may be a predisposing factor in the development of osteoarthritis of the knee,\textsuperscript{19-22} but the distinction between obese and morbidly obese is often uncertain.

As to outcome, again a distinction must be made between obese as defined by a BMI greater than 30 kg/m\textsuperscript{2} and the morbidly obese, with a BMI of over 40 kg/m\textsuperscript{2}. There have been a number of studies which have compared the results in patients with a BMI of less than 30 kg/m\textsuperscript{2} and those with a BMI greater than this. The results recorded vary. Some conclude that a BMI of over 30 kg/m\textsuperscript{2} has a negative effect on outcome.\textsuperscript{23} There may be an increased risk of infection and of complications with the wound.\textsuperscript{24,25} However, several studies have shown no difference in outcome at one,\textsuperscript{26} five\textsuperscript{27} and ten\textsuperscript{28} years between the two groups, and the rate of peri-operative complications was similar. It has been suggested that the incidence of patellar symptoms and of radiolucency around the implant is greater with increasing weight,\textsuperscript{29} but there does not appear to be an increase in the risk of loosening, perhaps because obesity limits mobility and may therefore decrease loading, thus lessening the risk of failure. However, in the morbidly obese the outcome is clearly worse and a further paper by Amin et al\textsuperscript{30} in this issue of the Journal shows significantly poorer functional and radiological results in a group of morbidly obese patients who underwent total knee replacement when compared with a matched group of patients of normal weight at a follow-up of four years. The true picture is unlikely to emerge until longer term studies are available.

Overall, although there have been no controlled trials which have assessed the influence of obesity, the current evidence suggests that there is no statistically significant difference in outcome in hip and knee replacement as influenced by weight unless the patient is morbidly obese, when the results begin to worsen. However, in these patients the improvement in their quality of life is still considerable\textsuperscript{14,31} and, provided they have been made aware of the increased risks, operation should not be withheld.

References


