Correspondence


Sir—We have read with great interest the comments of Drs. Eskelinen, Remes and Paavolainen on our Letter to the Editor.

Certainly, we agree with our colleagues that the reports by Capello et al. (2003), McLaughlin and Lee (2000), Aldinger et al. (2003) and Jacobsen et al. (2003) contain important information about uncemented hips. However, the authors agree with us that none of these reports have fulfilled the NICE criteria as was originally suggested in their paper.

We can accept the claim of the authors that the report by Kim et al. (2003) meets the NICE criteria; we already wrote in our previous letter that this paper approaches the minimum survival of 10 years, so we have no problem in accepting this as a paper on uncemented hips that meets the NICE criteria. Although there was no aseptic loosening of the components and a relatively low prevalence of osteolysis, the authors reported a high rate of linear wear of the polyethylene liner almost 10 years after surgery. It remains unclear if more revisions for this problem are pending in the coming years.

It was indeed remarkable that the report of McAuley et al. (2004) was not referred to in the original manuscript. Certainly, this report claims a survival rate of the THR of 89% at 10 years, with any reason as endpoint. Indeed, if liner exchange is excluded, the 10-year survival of this uncemented THR is 95%. However, does this remark mean that the Finnish hip register does not consider a re-operation for liner exchange to be a hip revision, as is done in the Swedish and Norwegian hip registers? The report of McAuley et al. is also very important because this report shows us the longest published survival of uncemented hips in patients less than 50 years.

In our previous Letter to the Editor, we mentioned that all the published reports of cemented hip implants that fulfill the NICE criteria had been omitted from the original paper. We therefore have a major problem with the answer of Drs Eskelinen, Remes and Paavolainen on this issue, which suggests that only one report on cemented hips is available which fulfills the NICE criteria (Keener et al. 2003). Studies from hip registers do have a major influence on orthopedic practice, therefore these reports should be of the highest standard, with an adequate overview of the literature. Although we sincerely believe that they have reported this to the best of their knowledge, the truth is somewhat different. We have found at least 8 studies on cemented hips in patients younger than 50 years and all of them have fulfilled the NICE criteria; many of them were already published some time ago (Boeree and Bannister 1993, Joshi et al. 1993, Devitt et al.1997, Emery et al. 1997, Kobayashi et al. 1997, Sochart et al. 1997a,b, Keener et al. 2003).

Long-term survival data in these reports on cemented hips (with revision for any reason as endpoint) are as follows: 60% after 30 years (Keener et al. 2003), 75% after 20 years (Joshi et al. 1993), again 75% after 20 years (Devitt et al. 1997) and 73% at 20 years (Sochart et al. 1997b). These long-term survival data of cemented hips are clearly superior to the longest report available of uncemented hips (McAuley et al. 2004), which has a survival rate at 15 years of 60% (endpoint: revision for any reason). After 10 years, there was a dramatic increase in liner problems and osteolysis. This problem of high wear of the liner was also reported in the only published study on unce-
mented hips that meets the NICE criteria (Kim et al. 2003).

In general, one should not be too optimistic about the survival of total hip implants, cemented or uncemented, in young patients. If concepts of hip implants inserted in young patients (less than 50 years old) are compared with the same implants in patients older than 70 years, the survival in the younger group is always less favorable. This is also shown by the data of the Norwegian and Swedish hip registers.

Certainly, one way of improving the outcome in younger patients is to choose the right implant. However, choosing the best combinations from the analyses of the Finnish register does not guarantee that young patients in Finland will indeed have the best outcome in future. First, concepts must be clinically proven over a period of at least 10 years, secondly ideal combinations may be less favorable in real clinical practice. In addition, both the Norwegian and Swedish hip registers and the study by McAuley et al. (2004) show that the results of uncemented hips deteriorate between 10 and 15 years after surgery. So, follow-ups even longer than 10 years are needed.

We are not “throwing away the baby with the bathwater”, as suggested. We also conclude that an uncemented stem with a cemented cup might perhaps offer young patients a better outcome. This so-called “reverse hybrid” combination is now popular in Norway. Time will tell us the outcome.

Indeed, we are looking forward with great interest to the analysis of results of THR designs (and combinations) in young patients from the Finnish arthroplasty register.

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Sir—We thank Drs. Schreurs and Gardeniers for their interest in our paper.

This topic is certainly important and worth discussing, so we wish to make the following comments.

First, it might be beneficial to remind the readers of Acta Orthopaedica about the NICE criteria. Using the most recently available evidence of clinical effectiveness, the best prostheses (using long-term viability as the determinant) demonstrate a revision rate of 10% or less at 10 years. This should be regarded as the current ‘benchmark’ in the selection of prostheses for primary total hip replacement (NICE 2003). It is certainly regrettable that so few published studies on the results of THA in young patients meet the NICE criteria. Studies that do not strictly meet the NICE criteria should not be abandoned, however, as they may contain important information.

Secondly, we would like to remind our colleagues that our study, based on the Finnish Arthroplasty Register, was about primary THA in young patients with primary osteoarthritis. Outcome of THA may be different depending on the pathology of the hip joint, especially in young patients (Joshi et al. 1993, Sochart and Porter 1997a).

Thirdly, we wish to comment on previous reports and the NICE criteria. Our honorable colleagues cited Kim et al. (2003), who reported a series of 80 patients (118 hips) with a mean follow-up of 9.8 years. Although the authors advocated the use of a 22-mm diameter femoral head for the increased rate of linear wear in their series (the average wear rate being 0.12 mm/year), the volumetric wear rate was low (on average 47.19 mm$^3$ per year) and, consequently, the prevalence of osteolysis was low. Kaplan-Meier survivorship analysis, with revision as the endpoint for failure, revealed a 99% rate of survival of the acetabular and femoral components at 10 years. Thus, it seems—at least to us—unjustified to speculate that revisions on account of wear problems can be expected in the future by Kim and colleagues.

The important study of McAuley et al. (2004) was not cited in our original manuscript. Again, we regret that we did not notice this excellent paper. Our colleagues asked which re-operations were considered to be revisions in the Finnish Arthroplasty Register. This was clearly stated in
the 16 sockets that developed radiographic loosen- 
ing in the young patients, rapid polyethylene wear 
was detected 5–10 years before socket loosen- 
ing.

Keener and co-workers (2003) reported a 60% survival rate at 30 years for 93 consecutive 
Charnley THAs. The authors did not, however, report the 
10-year survival rate for these patients—either in 
this paper, or in the previous reports on the same 
cohort (Sullivan et al. 1994, Callaghan et al. 1998). 
Thus, it is very difficult to conclude that the paper 
by Keener and colleagues would fulfill the NICE 
criteria. In this series, the average amount of linear 
wear was 0.0928 mm/year, and volumetric wear 
was 104 mm³/year.

Devitt et al. (1997) reported the results of 118 
Charnley arthroplasties in patients aged 50 years 
or younger at the time of surgery. The 10-year sur-

vival rate of these hips was not mentioned in the 
original paper, but inspection of the survival curves 
shows that it was clearly under 90%. What is more, 
patients with primary osteoarthritis showed a 64% 
survival rate at 20 years. Note that acetabular wear 
averaged 0.14 mm/year in these patients. The only 
description of uncemented hips fulfilling the NICE 
criteria reported a wear rate of 0.12 mm/year (Kim 
et al. 2003).

The report by Emery and colleagues clearly ful-

fills the NICE criteria (Emery et al. 1997). Wear 
rates were unfortunately not reported in this paper.

Boeree and Bannister (1993) reported the results 
of 46 cemented THAs in 34 patients. At a mean 
follow-up of 12 years, 6 of the 34 original patients 
had a surviving primary THA, meaning a 90% sur-

vival rate at 10 years for this series. Thus, the NICE 
criteria were fulfilled. The authors mentioned in 
the discussion that 6 other stems and 5 cups were 
likely to require revision for aseptic loosening in 
the near future.

Joshi and co-workers published results of 218 
Charnley THAs in 141 patients who were 40 
years old or younger at the time of surgery (Joshi 
et al. 1993). The probability of implant survival 
for these patients was 93% at 10 years and again, 
the NICE criteria were fulfilled. For patients with 
osteoarthritis, survival rate of the THA was about 
80% at 10 years (from inspection of the curve; the 
exact rate was not given), and 51% at 20 years. Is it 
really justified to claim that the results of cemented 
implants do not deteriorate after 10 years? The 
authors concluded that in young patients, cemented 
THA is a good procedure for those with rheumatoid 
arthritis—but that the results are much less reliable 
in those with osteoarthritis. We agree with them.

Schreurs and Gardeniers claimed that the Swed-

ish and Norwegian hip registers would have shown
that all implant concepts have poorer results in young patients. To the best of our knowledge, this kind of information has not been published from Nordic registers. Malchau et al. (2002) reported from the Swedish Arthroplasty Register that in general THRs in younger patients (< 55 years of age) show poorer survival than in older patients. In that study, the results of using different concepts were not compared between age groups. In the cohort of patients who were younger than 55 years at the time of the index operation, there was no significant difference between cemented, uncemented, and hybrid implants, although there was a trend toward superior results for the uncemented and hybrid fixation. In a study from the Norwegian Arthroplasty Register, Havelin and co-workers found that in younger patients (< 60 years of age), the uncemented circumferentially porous or hydroxyapatite- (HA)-coated femoral stems had better survival rates than the cemented ones (Havelin et al. 2000), which is in accordance with our results (Eskelinen et al. 2005). They also found that cemented cups had better survival than uncemented porous-coated cups, mainly because of higher rates of revision from wear and osteolysis in the latter. In our material, there was no difference between press-fit uncemented and all-polyethylene cemented cups, when all cup revisions were taken into account (Eskelinen et al. 2005).

What can we conclude about cemented hip implants in young patients with primary osteoarthritis? First, there has not been a single study about cemented THA in young patients with primary osteoarthritis fulfilling the NICE criteria. To be exact, this is also the case for uncemented implants, as the study by Kim et al. (2003) includes different hip diseases. Secondly, the results of cemented hip implants do deteriorate after 10 years of follow-up in younger patients. Thirdly, cemented cups do have problems, both with wear and aseptic loosening in these patients.

It must be noted that our study was based on the Finnish Arthroplasty Register. Most studies from single centers have a relatively small number of patients, and they often provide readers with results involving single surgeons. Register-based studies provide us with valuable insight into the use of the THA procedure in a certain patient group, as the number of arthroplasties under study (and surgeons) is usually large. Often, the results of a new implant or method are good in a single-center study—but can these results be generalized to the population level? This is a question to which only a register-based study may give the answer. Even so, we acknowledge that the current register-based study had certain limitations. We were not, for instance, able to report any subjective outcome measurements, e.g. Harris Hip Score or disease-specific quality of life measurements, or to perform radiographic analysis with wear measurements. When studying the results of THAs published in the literature, we should evaluate those based on registers and those reported by single centers from different points of view. Results from these different sources complement each other. Both types of studies will certainly be needed in future evaluations of the results of hip implants.

Our Dutch colleagues conclude that one could use an uncemented stem with a cemented cup, which would provide young patients with better outcomes. Whenever the femoral side is concerned, we absolutely agree. Our study has shown without a doubt that these young patients benefit from a modern uncemented stem (Eskelinen et al. 2005). The problem is really the acetabular side: aseptic loosening with the cemented cups (Eskelinen et al. 2005), wear and osteolysis with the uncemented modular ones (Harris 2003). In our opinion, there are three possible solutions: (1) the “reverse hybrid” concept discussed by our colleagues, (2) uncemented modular cups with improved liner congruence and diminished wear (and/or uncemented cups with molded polyethylene to avoid the back-side wear or loosening/breakage of the liner), and (3) hard-on-hard articulations, which have been widely used recently by orthopedic surgeons in Finland. There is a lack of long-term results with these three concepts. Certainly, only time will tell us the eagerly awaited answer.

Again, we thank our honorable colleagues for their interest in our paper, and for the fruitful discussions about this very important topic.


