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Medical audit

An audit of the out-patient follow-up of hip and knee replacements

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Medical records of 100 consecutive patients who underwent hip and knee replacements (56 hips and 44 knees) in 1997–1998 were studied. Particular attention was paid to the out-patient follow-up appointments with regard to any postoperative complication and intervention based on the clinical and radiological assessment conducted during the follow-up visit. The average period of follow-up was 845 days. During this period, these patients had 304 out-patient visits. Twenty-two patients had a problem during this period of whom 10 needed an intervention. Of the 10 patients who needed an intervention, 3 were identified during the routine out-patient visits whereas 7 were either by general practitioner referral or were seen in the accident and emergency department. At these appointments, 187 radiographs were taken. Of these, 8 (4.3%) showed some abnormality. The minimum cost for these follow-up appointments was estimated to be £23,297. We recommend that the postoperative out-patient appointment of the patients with hip and knee replacements should be restricted to a visit at 6–12 weeks followed by discharge if no problems are anticipated.

Key words: Cost-effectiveness – Hip and knee replacement – Postoperative – Out-patient follow-up

The practice of follow-up following a hip or knee replacement surgery is extremely variable.[1–5] There is hardly any evidence in the literature approving or disproving the cost-effectiveness of the postoperative out-patient follow-up of these patients. A literature search (MedLine, 1966–2000) revealed just a single paper regarding the out-patient follow-up of patients with hip replacement.[5] These observations prompted us to undertake this audit project. The underlying considerations were: (i) is the process of follow-up cost effective?; and (ii) are patients getting poor service by not being followed up?

Patients and Methods

The case records of 100 consecutive patients who were operated on in 1997–1998 for hip or knee replacement were reviewed. All these patients had a minimum follow-up period of 2 years. The case-notes and the radiology report on each out-patient appointment were recorded and a database was made. Data collected were: type of operation, date of operation and postoperative complication if any, dates of out-patient follow-up appointments, any complaint of the patient or any problem revealed during examination at out-patient visits, X-rays taken during the visits or not, and whether any intervention was required as a result of the visit and/or the X-rays taken. An intervention was defined as any procedure involving admission, investigations and/or treatment for a postoperative complication.

Results

Of the 100 patients, 56 had a hip replacement whereas 44 had a knee replacement. There were a total of 304 out-

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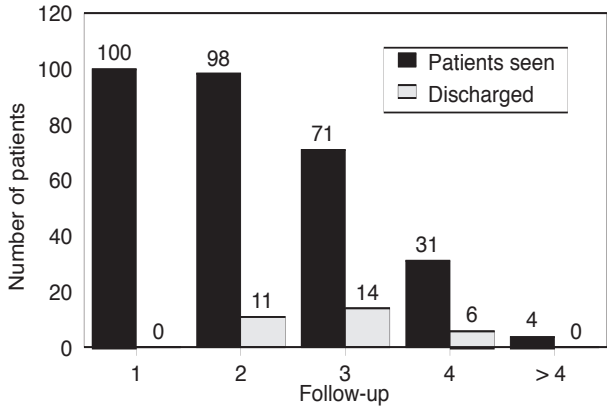

Figure 1 The number of patients seen and discharged at each follow-up appointment.

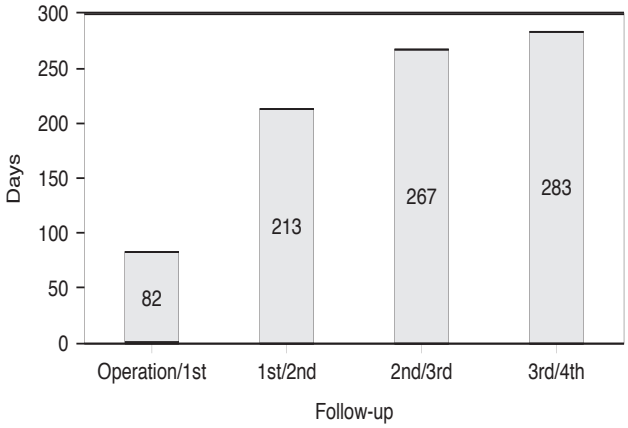

Figure 2 The average time gap between the follow-up appointments.

patient appointments for these patients. All the patients were seen at least once in the out-patient clinic post-operatively. The average period of follow-up was 845 days. During this period, 31% of the patients were discharged. None of these was discharged following the first follow-up (Fig. 1). The average time gaps between the follow-ups are shown in Figure 2.

No problem was reported by 78% of the patients. The various problems reported at each follow-up are summarised in Table 1. Of the 22 patients who had a problem during this period, 10 needed an intervention (Fig. 3 and Table 2). Of those patients needing an intervention, 3 were identified from the out-patient clinic (2 patients with restricted ROM following knee replacement and 1 patient needing a revision hip replacement for loosening). The other 7 patients were either a GP referral or were seen in the accident and emergency department.

During this period, 187 radiographs were done (101 for hips and 86 for knees). Pathology was reported on 8 (4.3%) radiographs. There was a suspicion of loosening on 5 radiographs while 3 X-rays had trochanteric wire break-down. Interestingly, all the patients with trochanteric wire

Table 1 The various problems at the four follow-ups

Number	Joint	Follow-up			
		1	2	3	4
1	Hip	Shortening	–	–	–
2	Hip	Gait problems	–	–	–
3	Hip	–	–	Gait problems	Pain
4	Hip	–	Gait problems	–	–
5	Hip	–	–	Gait problems	–
6	Knee	–	–	Cellulitis (A&E)	–
7	Knee	–	Pain	Cellulitis (A&E)	Pain
8	Knee	Restricted ROM	–	–	
9	Hip	–	Pain (A&E)	–	Pain
10	Hip	–	–	–	Pain (A&E)
11	Hip	Gait problems	–	–	
12	Hip	–	Pain	Pain	–
13	Knee	Restricted ROM	–	–	–
14	Knee	Foot drop	–	–	–
15	Hip	–	–	Dislocation (A&E)	–
16	Hip	Wound problems	–	–	–
17	Knee	Pain	–	DVT (GP)	–
18	Hip	–	–	Pain	–
19	Hip	Dislocation (A&E)	–	–	–
20	Knee	Superficial infection (GP)	–	–	–
21	Knee	Wound problems	–	–	–
22	Knee	DVT (GP)	–	–	–

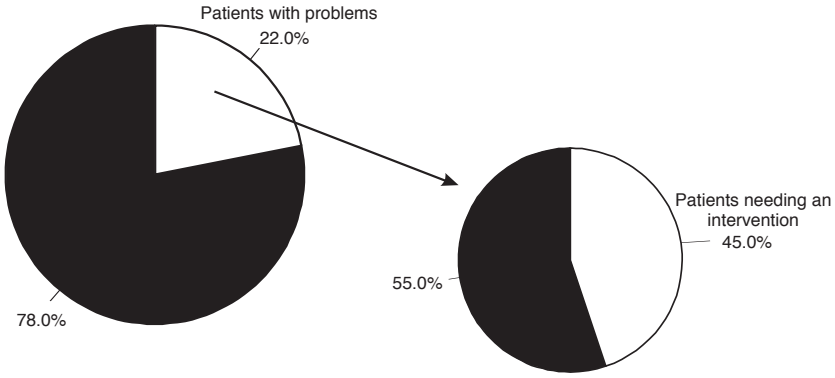

Figure 3 (A) The percentage of patients with problems and (B) of those patients with problems, the percentage requiring an intervention.

Table 2 The number of patients who required an intervention during the follow-up period

Intervention needed	Patients (*n*)
Manipulation for restricted ROM	2
Revision surgery	1
Reduction of dislocation	2
Treatment for DVT	2
Antibiotics and observation for cellulitis	2
Referral for second opinion	1

breakdown were clinically asymptomatic. Of the ones with suspected loosening, a bone scan confirmed this in one patient.

The cost for one out-patient appointment was estimated to be £50 (excluding the transport cost). The cost for 304 appointments for these 100 patients was thus calculated to be £15,200. The cost of the radiographs done was estimated to be £8097 (£41 for a hip X ray and £46 for a knee X-ray). The minimum cost for the follow-up of these 100 patients over a period of 2 years was estimated to be £23,297.

Discussion

The follow-up arrangements for patients with joint replacements vary across the UK.[1–5] There are no guidelines for the follow-up of these patients and 10% of consultants do not follow-up their patients after hip replacement.[1] Most consultants who follow their patients do so 2 or 3 times in the first year after operation, and 54–66% of consultants discharge these patients after the first year of their operation.[1–3]

The British Orthopaedic Association recommends the clinical and radiological follow-up of patients in the longer term, the minimum requirement being an antero-posterior and a lateral X-ray at 5 years and each 5 years thereafter.[4] In the report by the Comptroller and Auditor General, it is recommended that the National Institute of Clinical Excellence should be asked to issue guidance on the frequency and duration of follow-up for hip replacement patients. Also recommended in this report is that the NHS trusts should consider options for cost-effective follow-up.[1]

Evidence-based medicine and cost containment have been the issues in health care provision lately. Audit of health care delivery can be categorised into input, process, and outcome. This particular audit is focused on process. In a situation where more than one process is available for a given condition, if the outcomes are the same, it would appear sensible to adopt the least expensive process.

It was observed that the frequency and duration of the follow-up and tendency to X-ray at each visit following hip and knee replacements varied widely across the firms. Of the 100 patients in this study, 78 were asymptomatic throughout the follow-up. Of the 22 patients who had some kind of problem, only 10 needed an intervention. Out of these 10, only 3 patients had problems which justified their out-patient follow-up visits.

Most of the problems especially those requiring an intervention were observed at the first out-patient appointment (Table 1). Therefore, if these patients are to be followed-up, the first follow-up visit at 6–12 weeks appears to be sensible. Further visits, especially if the patient has no problems at the first appointment, appear to be a waste of time and resources especially in the presence of long waiting lists for new patient appointment. The follow-up of the patients in our study is 2–3 years postoperatively. It would be interesting to audit a group of patients with 5–10 years' follow-up after hip and knee replacements to study its cost effectiveness.

Resources for the provision of health care are scarce, in that there are not, and never will be, enough resources to

satisfy patient needs completely. The economist notion of 'opportunity cost' (*i.e.* the cost of using resources in one health care programme) is the value of the benefits they would have generated in their best alternative use.[6] The reformed NHS aims to provide effective services at the least resource cost, and on such a scale that the benefit from having more resources is no larger than their cost.[7] Lack of funds and pressure of work has compelled NHS trusts to take initiatives to undertake follow-up of joint replacements cost effectively. The Norfolk and Norwich Healthcare Trust follows up patients by reviewing a patient questionnaire and X-rays at 1, 2, 5, 7 and 10 years after operation that are examined by a trained nurse. Any patient who is suspected of loosening or other complications is referred to a consultant orthopaedic surgeon for review.[1] A similar system in which X-rays of these patients are reviewed regularly could be a cost-effective alternative.

Conclusions

This study suggests that the routine clinical and radiological examination at the out-patient follow-up appointments of patients with hip and knee replacement is not cost-effective. In a setting of effective family health care and community health visitors, any concerns could be easily picked up and appropriate referrals made to the hospital, making routine visits unnecessary.

The time and expense incurred as a result of this routine follow-up could well be utilised in other areas of clinical need, for instance, the time could be used to cut down the waiting time for new patients' appointments. It might be useful to have a multicentre audit of these patients and to have a discourse of this issue with risk management units to see the implications of not following up patients after these major procedures.

An alternative of not following these patients routinely in out-patient clinics could be a system in which routine radiographs of these patients are reviewed by trained medical staff that can refer the patient to a consultant if a complication is suspected.

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