MRI CAN PREVENT UNNECESSARY ARTHROSCOPY

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We compared the practice of four orthopaedic consultants as regards the use of MRI and arthroscopy to diagnose problems of the knee. In one year 324 arthroscopies and 66 MR scans were performed for this purpose.

We found that MRI is a reliable and cheaper alternative to 'diagnostic arthroscopy'. We consider that patients with definite clinical signs merit an early 'therapeutic arthroscopy', but that all other knees should be investigated by MRI. This policy spares patients from unnecessary and expensive surgery.

Arthroscopy for diagnostic purposes should be used only with a specific purpose. Modern MRI can and should replace "having a look".

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Our study was prompted by the need to reduce costs; it had been suggested that expensive MRI was being requested unnecessarily. Knee arthroscopy in general has been reported to produce negative results in between 29% and 50% of cases,^{1,2} while MRI can provide a reliable diagnosis of meniscal and cruciate problems.² There may be difficulties in interpretation,³ but diagnostic accuracies of 89% to 93% for medial meniscal tears and 95% to 98% for tears of the anterior cruciate ligament have been reported.⁴ It seems that the use of MRI may actually reduce costs and still maintain accuracy.^{5,6}

PATIENTS AND METHODS

We retrospectively reviewed the notes of all patients, referred primarily, who had MRI of the knee or an arthroscopy between 1 June 1993 and 31 May 1994. In this

period, 314 patients (221 male, 93 female) had 324 arthroscopies (148 left and 176 right). Their mean age was 34 years (7 to 89). A total of 66 MR scans of the knee was performed (44 male, 22 female).

We recorded a *negative arthroscopy* when no significant pathology was identified and no procedure was undertaken, and a *diagnostic arthroscopy* when the clinical diagnosis was in doubt.

Four orthopaedic consultants saw patients with knee problems during the period of the study. One of these (JT) has a special interest in knee surgery, but we recorded only primary referrals from general practitioners and excluded all tertiary referrals. The patients were all seen as out-patients and recommended for arthroscopy or MRI by one of the four consultants. All the arthroscopies were performed by a consultant and all MRI was on the same machine and reported by one consultant radiologist.

For the purpose of our study we separated patients into two groups: group 1 comprised those seen by the consultant with a special interest in knees (JT) and group 2 consisted of patients belonging to the remaining three consultants.

The case notes were reviewed to assess the arthroscopy rates and findings, the MRI rates and findings and the subsequent management of the patient.

RESULTS

The main findings are summarised in Tables I and II. There was a lower negative arthroscopy rate for the knee surgeon, probably due to better clinical diagnosis and the greater complexity of his cases.

The cost of MRI during the study period was about £120 (\$200) per scan, including the consultant's report. The mean cost of day-case arthroscopy was £374 (\$620), but since 22% of patients actually stayed overnight or longer, this figure represents the minimum cost.

In group 1, the specialist knee surgeon performed arthroscopy after MRI in 17 patients. The additional cost of the MRI was $17 \times £120 = £2040$ (\$3400). A total of 37 patients had MRI and did not require arthroscopy or declined it. Had MRI not been available, all would have had an arthroscopy at a cost of $37 \times £374 = £13\,838$. The 37 MR scans cost £4440 and the total saving was therefore £9400 (\$15 500). Thus, the use of MRI saved £9398 – £2040 = £7358.00 and spared 37 patients from surgery.

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Table I. Number of arthroscopies performed in the two groups

Arthroscopies	Knee specialist	Other consultants
Total	131	193
Negative (%)	13 (10)	47 (24)
Diagnostic, with no MRI (%)	23 (17)	71 (37)
Negative diagnostic	6	28

Table II. MRI of the knee in one year in the two groups

	Knee specialist	Other consultants
Total	54	12
Arthroscoped later	17	3
Arthroscoped after positive MRI	17	1
Arthroscoped after negative MRI	0	2
Positive findings at arthroscopy	17	1
Not offered surgery or declined it	37	9

In group 2, the other three surgeons performed 28 negative diagnostic arthroscopies, costing £10 472. MRI for all would have cost £3360. Assuming that MRI would also have been negative, its use in all would have saved £10 472 – £3360 = £7112 and spared 28 patients from surgery.

DISCUSSION

In group 1 the use of MRI for doubtful cases reduced the negative arthroscopy rate to 11%. MRI in this group allowed a positive diagnosis in 17, who then had the necessary planned surgery.

On the basis of our results we now advise MRI for all

knees in which the diagnosis is in doubt. One exception is in the assessment of the patellofemoral joint, for which we use CT. We no longer perform any diagnostic arthroscopies and consider that these should be condemned, except for specific purposes. Information obtained from a careful history and clinical examination, followed when necessary by MRI, can ensure that fewer unnecessary arthroscopies are performed. Modern MRI and its accurate interpretation should abolish the need "to have a look". We have also shown that there is a financial as well as a clinical benefit both for specialist knee surgeons and general orthopaedic consultants.

We estimate that the routine use of MRI could save our unit over £14 000 (\$23 100) per year. We have used the findings to support a business case for improved local provision of MRI.

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