ARTHROSCOPIC SURGERY FOR CHONDRAL FLAPS
IN THE KNEE

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A retrospective review of 50 knees in 46 patients treated by arthroscopic removal of chondral flaps is reported. There was a relationship between the site of the flap and the type of symptoms: patellofemoral flaps produced anterior knee pain, posterior condylar flaps produced instability.

At review after 18 to 36 months, after a second arthroscopy in eight cases, 44 of the 50 knees had retained significant improvement and 33 were symptom-free.

Chondral flaps on the articular surface of the knee, which do not involve bone, were described by O’Donoghue (1966), Dandy (1981) and Johnson-Nurse and Dandy (1985), but there have been no reports on the result of treatment.

Chondral flaps must be differentiated from other conditions, including osteochondritis dissecans and articular cartilage degeneration. Osteochondritis dissecans shows a bony component on radiographs and raw bone can often be seen arthroscopically. Soft degenerative fibrillation of articular cartilage has a distinct appearance (Fig. 1) which is very different from the well-defined chondral flap surrounded by normal articular cartilage. Chondral flaps may be associated with an area of frank degeneration but this is easily recognised by the presence of an area of bare bone. Iatrogenic chondral flaps have a different shape; the edge of a sharp trocar produces long thin flaps (Fig. 2) in contrast to the thick flaps which produce symptoms.

This paper reports a retrospective review of patients in whom chondral flaps (Fig. 3) were the main pathological lesion diagnosed and treated by arthroscopy.

PATIENTS AND METHODS

Significant chondral flaps were seen in 77 knees in 70 patients arthroscoped over a three-year period before November 1983. In 27 knees in 24 patients there had been an additional diagnosis or the arthroscopy had been an urgent one and there had been no previous long-term symptoms.

Thus, in 50 knees in 46 patients, a chondral flap had apparently been the sole cause of symptoms. The patients were assessed before operation and postoperatively at six, 12, and 24 weeks and at one year; many cases have also been assessed at two, three and four years.

The criteria of Tapper and Hoover (1969) were used to grade symptoms and function:
Grade 1 – Normal knee: normal sporting activities.
Grade 2 – Normal knee: slight symptoms on sporting activities.
Grade 3 – Intermittent pain or other symptoms: no sports.
Grade 4 – Severe symptoms: unable to work, no sports.

Patients were asked to point to the site of their maximum pain and this was recorded, as were symptoms, especially “sticking” (intermittent blocking of movement in any direction), “instability”, “giving way” and “locking” (intermittent blocking of full extension).

Technique of arthroscopic surgery. A pneumatic tourniquet is used without exsanguination. An anterolateral portal is used for the arthroscope, and an anteromedial one for instruments. A superomedial portal is sometimes needed for access to patellar flaps.

Chondral flaps are excised with a 4 mm straight or curved grasping forceps, applied to the base of the flap. The bed of the flap is then trimmed with right-angle punch forceps (Fig. 4) and the defect is carefully probed to ensure that its edges cannot be lifted to produce another flap (Fig. 5). The tourniquet is released and the joint washed through until clear fluid is returned. Power tools such as chondrotomes or burrs are never used.

RESULTS

The age of the 46 patients ranged from 16 to 70 years, 26 being under 30 and only six over 40 years of age. Two-thirds of the patients were men. With regard to symptoms, 36 knees had anterior pain, two only had
medial pain, 10 had posterior pain with instability and two had posterior pain with stiffness. In all cases the pain was intermittent.

These symptoms had been present for between four and 36 months before arthroscopy, between 12 and 24 months in 24 and over 24 months in six.

The chondral flaps were from the patella in 20 knees and on the intercondylar surface of the femur in four. The medial femoral condyle was involved in 19 knees; in only three of these were the flaps from the posterior third of the condyle. In all, seven flaps were from the lateral condyle, of which five were posterior. There was a close relationship between the site of the flaps and the type of symptoms. All 24 patellofemoral flaps were associated with anterior knee pain and no instability, although some had occasional sticking. Of the eight cases with posterior flaps on the femoral condyles, seven reported symptoms of instability.

Follow-up was 16 months in eight patients and between 16 and 36 months in 35 patients. Mean follow-up was 21 months, with a minimum of 16 months; in no case was there evidence of improvement or deterioration in symptoms or signs after six months. Before operation 41 knees were classed as Tapper and Hoover Grade 3 and nine Grade 4. Postoperatively 40 knees were Grades 1 and 2 and 10 knees were Grades 3 or 4. These 10 knees were regarded as failures, although three of them had improved from Grade 4 to Grade 3. In all, eight knees were improved by three grades and 32 knees by two grades. Three knees improved by one grade and seven had no improvement. No knee was made worse by surgery.

Of the 10 failures, eight had a review arthroscopy. In two knees a new flap had developed at the site of the previous excision, and in two others there was a new lesion, a tear of a meniscus. In these four knees, the second operation produced improvement by two grades. In the other four knees, no new lesion was found, the bed of the original flap was smooth and no cause could be found for the continued symptoms.

Of the 39 patients who were employed, 26 returned to work by two weeks and all by five weeks. Of 26 patients who had played sports before injury, 22 had returned by seven weeks and the rest by 11 weeks.

DISCUSSION

This review has clearly shown that arthroscopic removal of chondral flaps can relieve signs and symptoms in an affected knee. It has been suggested that the benefit is
produced mainly by the washing-out. However, review of a series of 30 arthroscopic washouts for obvious intra-articular debris secondary to degenerative change, treated during the same period, showed that only 15 were improved at six weeks. This improvement was maintained in only six after 12 weeks, but was then maintained at six and at 12 months. The success rate of 20% for washing out degenerative debris compares unfavourably with the 80% success of flap removal, confirming that the removal of the flap is the important part of the treatment. A longer follow-up will be required to confirm the continued absence of symptoms.

Sandow and Goodfellow (1985) have suggested that anterior knee pain is a self-limiting condition which always improves and does not require treatment. This may well be true of adolescent non-sporting girls, but some of the patients reported here were rapidly cured of anterior knee pain of three years' duration by removal of an anterior chondral flap. Any history of injury is regarded as an indication for arthroscopy in cases of anterior knee pain. The cause of these flaps is not clear. It would be easy to regard them all as fractures, except for the fact that more than half gave no history of trauma. The concept that they occur at the site of stress raisers is appealing but unproven. The long-term value of the removal of chondral flaps will be established only when cases have been followed for five to 10 years, but this review has shown good short-term results.

REFERENCES


