

**“Disease is from old and nothing about it has changed. It is we who change as we learn to recognise what was formerly imperceptible”**

*Jean Marie Charcot (1825-1893)*

## SUMMARY

**20 patients with chondromalacia patellae (Patello-Femoral Arthralgia) and malalignment syndromes of the patella operated on at the Military Hospital between January 1980 and October 1983 have been reviewed.**

**The terminology, aetiology, clinical manifestations and management of these conditions are discussed.**

## INTRODUCTION

Chondromalacia patellae is only rarely a full clinical diagnosis. It means softening of the cartilage and to many clinicians the term is synonymous with patello femoral arthralgia which has many causes and may be primary, due to intrinsic causes in the patella, or secondary as a consequence of other pathology in the knee joint.

We wish to report on 20 patients treated surgically at the B.D.F. hospital between January 1980 and October 1983 for patello femoral arthralgia due to intrinsic causes in the patella.

## Patients

Twenty patients have been operated on for patello femoral arthralgia as conservative management failed to control their symptoms. Their ages ranged from 21 to 50 and fourteen were 25 years of age or under. Three patients were female and seventeen were male, reflecting the nature of our clientele i.e. mainly young soldiers, policemen and sports personnel.

# Malalignment Syndromes and Chondromalacia of the Patella

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Symptoms were present for 1 to 8 years and all have been improved although the follow up period is short in some patients. Arthroscopy outruled other pathology and confirmed the diagnosis in all patients.

All had a lateral release, one had medial reefing in addition and three more also underwent patellar realignment.

## DISCUSSION

### 1. Malalignment Syndromes of the Patella :

Malalignment of the patella occurs when the latter deviates from the normal axis of movement on the patellar surface of the lower anterior femur during flexion and extension of the knee. This may present as a dislocation or subluxation and may be permanent or recurrent — terms which are self explanatory.

These Syndromes may result from an initial violent dislocation or subluxation or may be

due to one or more of the following: (1)

1. Relaxation or attenuation of the patellar retinaculum
2. Contracture of the lateral patellar retinaculum
3. Genu Valgum
4. Genu Recurvatum
5. Femoral neck anteversion or internal femoral rotation
6. External tibial torsion
7. Lateral insertion of the patellar tendon on the tibial Tuberosity
8. Hypoplasia or flattening of the lateral femoral condyle
9. Hypoplasia or dysplasia of the patella
10. Patella alta or high riding patella.

Additional factors may include atrophy of the vastus medialis hypertrophy of the vastus lateralis and generalised joint laxity.

These malalignment syndromes proceed sooner or later to cartilage damage (Chondromalacia) and finally to patello-femoral arthritis, as can the following conditions that cause patello-femoral arthralgia.

### 2. Chondromalacia Patellae (or Patello-Femoral Arthralgia).

The term chondromalacia means soft cartilage and is not a full clinical diagnosis. It implies an anatomical or histological lesion, the macroscopic changes of which can be readily demonstrated during arthroscopy and arthrotomy. In the English literature it has become synonymous with pain originating in the patello-femoral joint in the absence of

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malalignment syndromes (see above). We prefer the term patello-femoral arthralgia, as this underlines the need to search further for aetiology.

However, some patients with both patello-femoral arthralgia and softening of the patellar cartilage as the apparent cause who do not fall into categories (a) or (b) (see below) may still be said to be suffering from chondromalacia patellae (c) (below).

### ETIOLOGY :

A history of trauma, usually a direct blow to the patella or a twist of the knee is often present but this may simply have drawn attention to a pre-existing condition. O'Donoghue (2) believes that any condition that disturbs the normal rhythm of the quadriceps mechanism such as locking of the knee by a torn cartilage may be a major cause of Chondromalacia and advises early meniscectomy. However, the initial trauma may have been the cause of both the torn cartilage and the chondromalacia.

Most authors hold that the medial articular facet of the Patella is the site of the earliest and most severe changes (3). However from a study of 100 knees at necropsy Abernethy et al (1978) (4) concluded that the cartilage changes affecting the medial facet of the patella should be considered "an asymptomatic, age related, physiological change not requiring surgical "intervention". And in their study of necropsy material Meachin and Emery (1974) (5) found it unusual for the cartilage changes on the medial facet to progress to an erosion of bone. The cartilage changes which had progressed to bony erosion first appeared on the central part of the lateral facet.

We would suggest that softening of the cartilage of the medial facet produces transient symptoms in adolescents, is a self limiting condition and only occasionally requires surgical intervention. It rarely progresses to osteoarthritis and is liable to overdiagnosis and over-treatment (Taor, 1981) (6). However patello-femoral arthralgia with cartilage softening of the lateral facet more often requires surgery and often progresses to osteoarthritis.

That patello-femoral arthralgia is largely due to excessive contact pressure between the patella and the lateral femoral condyle caused by a tendency for the patella to be drawn laterally is being increasingly accepted.

Indeed, Ficat and Hungerford (1977) (7) distinguish three causes of patello-femoral arthralgia.

- a. Excessive lateral pressure syndrome (ELPS) due either to excessive lateral ligamentous tension or disruption of medial stabilisers. Axial X'rays at 30°, 60° and 90° with or without contrast medium will rule out subluxation and show an area of localised narrowing of the patello-femoral joint line. The lateral patellar articular facet is mainly affected and the condition occurs in adolescents and adults.
- b. Reflex sympathetic Dystrophy — also known as causalgia or Sudeck's Atrophy is a well documented but little understood condition that almost always follows trauma including previous surgery. When the patello-femoral joint is affected the decalcification is usually distinguishable from disuse osteoporosis (4) and the micro cystic appearance of bone when osteoporosis is severe is pathognomonic.

- c. The Chondromalacias (i) Chondromalacia of the medial facet — seems to be secondary to incongruence and a combination of compression and shearing forces. This occurs predominantly in the second decade and X'rays are normal. (ii) Global Chondromalacia — the entire articular surface of the patella is affected. This can be an extension of (a) or (c) (i) or follow a fracture of the patella.

Another recently described cause (8) of patello femoral arthralgia occurs during the so called "growth spurt" in children training for organised sports. The peak incidence of this is at age 12 in girls and 14 in boys. The extensor mechanism of the knee does not keep pace with the rate of growth of the upper end of the tibia and lower end of the femur resulting in tightness of the extensor mechanism and excessive pressure of the patella on the femur. Ordinarily this does not give rise to severe symptoms but is being increasingly recognised due to the excessive trauma sustained as organised sport becomes more prevalent in schools. Some of these patients would fall into the category (c) (i), above.

### CLINICAL MANIFESTATIONS OF CHONDROMALACIA OF THE PATELLA

#### Incidence :

Patello femoral arthralgia occurs at all ages but is most common from the second to fourth decades and females are said to outnumber males 3:2. In our practice we see more males than females reflecting the fact that most of our patients are either in the army, police force or are involved in sports. The disorder is often bilateral.

### Symptoms :

- a. Pain is retro patellar and is worse when the knee is under load, making going up-stairs more difficult than going down. Prolonged sitting with the knee flexed beyond 90° characteristically produces pain. Praying becomes difficult and squatting impossible.
- b. Crepitus is often present and may be audible but there is no close association between the crepitus and pain and as it is often present in asymptomatic joints is not of much diagnostic significance.
- c. Giving way — this is most common while going up-stairs or walking down an incline and is due to a sudden relaxation of the quadriceps.
- d. Locking — true locking does not occur.
- e. Swelling — An effusion is seldom marked and is often absent. It seems to be more common when the cartilage changes are advanced.

### Signs :

- a. Sub patellar tenderness — This is usually present and is often more marked on the medial side.
- b. Pain on pushing the patella distally and pressing it against the femur is characteristic and sometimes apprehension is seen on the part of the patient. This must be distinguished from the **Apprehension Test** first described by Sir Thomas Fairbank (1937) (9) which is produced when the patella is pushed laterally in recurrent dislocation and subluxation of the patella.

- c. Abnormal mobility of the patella during flexion and extension of the knee will be found in recurrent dislocation and subluxation.
- d. Serous effusion — as stated above this may be present when the cartilage changes are advanced.
- e. The Q angle should be measured and recorded in all cases. In males the Q angle should normally be 8° — 10° and in females the normal is 15°  $\pm$  5°.
- f. Any of the associated conditions listed under malalignment syndromes of the patella may be present.

### Differential Diagnosis : (Ficat and Hunderford 1977 (7) )

- a. Bursitis affecting either the prepatellar, retropatellar or pes anserinus bursa.
- b. Fat Pad Syndrome
- c. Generalised synovitis
- d. Ligamentous instability
- e. Meniscal lesions. The physical signs of a torn medial meniscus are very similar to those of recurrent dislocation of the patella and often coexist. An “internal derangement” of the knee joint in a young woman should be presumed to be a patellar subluxation until proven otherwise.

As J.C. Hughston put it “The orthopaedic surgeon who has not mistaken a recurrent subluxation of the patella for a torn meniscus has had a limited and fortunate experience with knees and meniscectomies”.

### Investigations :

- a. X-ray — This will include AP and lateral films as well as a view of the intercondylar notch and axial views of the patella at 30°, 60° and 90° and may include contrast medium if an interested radiologist is available.
- b. Arthroscopy — The technique employed by us at the Military Hospital for this investigation will be presented in a future paper. Our indications are as follows :
  - i. An acute episode, eg. dislocation of the patella
  - ii. Patients with severe symptoms
  - iii. Patients with less severe symptoms not responding to conservative management.
  - iv. When the diagnosis is in doubt
  - v. When surgery has been decided on

Four degrees of Chondromalacia are seen at arthroscopy

1. Slight fibrillation
2. Moderate fibrillation
3. Severe fibrillation
4. Underlying bone is exposed.

### Management :

The majority of our patients are managed conservatively — only 20 coming to surgery in the period between January 1980 and October 1983.

When symptoms are mild, many patients improve with rest, and physiotherapy including exercises

within the limits of pain, short wave diathermy and ultrasound. Local heat is applied prior to exercise and ice packs afterwards. Analgesics and anti-inflammatory tablets are prescribed as required, two of the latter being taken two hours before exercises.

There is some evidence that a single injection of intra-articular hydro-cortisone may help by reducing the chemical inflammation of synovitis, but repeated injections in experimental animals have produced cartilage degeneration resulting in a Charcot like arthropathy. We use steroids very rarely, never twice and never in the younger patient.

Arthroscopy precedes surgery in all patients and the findings are recorded on a purpose designed diagram. It not only provides a reliable diagnosis but also aids in determining on indication for and technique of an operation.

Operation is indicated when troublesome symptoms persist after adequate conservative treatment but no method can be relied upon consistently to be successful. The surgical management of chondromalacia of the patella will depend on the aetiology, the age of the patient, the stage of the disease at diagnosis and the presence of associated pathology.

Malalignment of the quadriceps mechanism and patella alta must be recognised and treated appropriately — the procedures most widely used include :

1. Lateral release
2. Medical reefing or transference of medical structures to strengthen medial support.
  - a. Distally by transferring the patellar tendon insertion medially and or distally.

- b. Proximally by advancing the vastus medialis distally on the patella.

Transplantation of the tibial tuberosity is contraindicated until closure of the proximal tibial epiphysis has occurred as genu recurvatum requiring corrective osteotomy may result with continued growth.

Local treatment of abnormal area of cartilage includes shaving of the cartilage until (the bone) looks normal (Insall et al 1976) (10) or down to subchondral bone (Goodfellow et al 1976 (11) which may or may not be drilled. The medial condylar ridge may also be removed as advocated by Outerbridge and Dunlop (1975) (12).

When patello femoral chondromalacia is severe realigning the quadriceps mechanism and/or local treatment to the abnormal cartilage may not relieve symptoms and patellectomy may be necessary.

Genu varum is a common deformity in Bahrain and is probably genetic in origin; the tibia angles medially below the knee. A lateral release may relieve symptoms of chondromalacia in these patients and can be carried out when this is diagnosed at arthroscopy as it is a simple procedure and is performed via the same stab incision used for arthroscopy. However, osteotomy to correct the Genu varum should form part of any more extensive procedure planned.

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