

# Epidemiology of meniscal lesions in the knee

## 1,215 open operations in Copenhagen 1982-84

Adam Hede<sup>1</sup>, Dennis B. Jensen<sup>1</sup>, Peter Blyme<sup>1</sup> and Stig Sonne-Holm<sup>2</sup>

In a suburban area of Copenhagen with approximately 620,000 inhabitants, all the openly operated on meniscal lesions of the knee joint between 1982 and 1984 inclusive were reviewed. The mean annual incidence of meniscal lesions per 10,000 inhabitants was 9.0 in males and 4.2 in females. The highest incidences were seen in the 3rd, 4th, and 5th decades of life. A higher frequency of trauma related to onset of symptoms was found among males (77 percent) than among females (64 percent). The bucket-handle lesion was the most frequent type of meniscal lesion in males (35 percent), whereas peripheral detachment was the most frequent in females (41 percent). A variable frequency of trauma inducing the lesions in males and females did not explain differences in type of meniscal lesion. Nineteen percent of our 1,215 patients had a partial meniscectomy, whereas 0.7 percent had meniscal repair.

In an unselected population, we have assessed retrospectively the incidence of openly operated on meniscal lesions and have analyzed the relationship between trauma and the type of lesion.

### Population and methods

During 1982 through 1984, a total of 1,215 persons living in Copenhagen County, with approximately 620,000 inhabitants during the period, were treated openly for a meniscal lesion at one of the three hospitals in the county performing orthopedic surgery. Thirty-two patients were operated on twice and 1 patient had three operations. The mean age of the 812 men and 403 women was 36 (3-83) years.

To describe the total number of treated meniscal lesions rather than the number of different subjects, calculations and figures are presented without excluding patients who underwent more than one meniscus operation during the 3-year period.

Information on whether a trauma was related to the debut of symptoms and type of lesion was obtained from patient records—a trauma being defined as a single event of physical violence to the knee. All the operations were performed openly, and only 18 were preceded by a diagnostic arthroscopy. Lesions were classified according to Lidge (1979), with recording of the peroperative findings and type of operation performed. Men and women were divided into 10-year age groups.

The population of Copenhagen County was stratified into similar groups according to information obtained from the Danish Central Bureau of Statistics.

The overall incidence for the entire 3-year period was calculated because no differences between the 3 years were found (Andersen 1977). The two-way relationships between the sex of the patients, trauma-associated onset of symptoms, and type of meniscal lesion were calculated with a chi-square test. The three-way relationships between these three variables were analyzed with a chi-square test for conditional independence (Kreiner 1987).

University of Copenhagen Departments of Orthopedics, Gentofte Hospital<sup>1</sup> and Hvidovre Hospital<sup>2</sup>

Correspondence: Dr. Adam Hede, University of Copenhagen Department of Orthopedics U-2162, Rigshospitalet, DK-2100 Copenhagen, Denmark

Table 1. Incidences per year per 10,000 inhabitants of surgically treated meniscal lesions in Copenhagen County 1982-1984

Age groups	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	≥ 90	All ages
Males	0.0	4.8	17	17	14	5.8	2.9	1.0	0.9	0.0	9.0
Females	0.2	5.5	5.9	5.4	5.1	6.0	2.1	2.0	0.4	0.0	4.2
All	0.1	5.2	11.4	11.3	9.4	5.9	2.4	1.6	0.6	0.0	6.6

## Results

The mean annual incidence for openly operated on meniscal lesions was respectively 9.0 and 4.2 per 10,000 for the men and women ( $P < 0.001$ ). The highest incidence in men was 17 in the 20-39-year-old age groups, gradually decreasing to 1 in ages above 70 years (Table 1). In women the incidence per 10,000 was stable until 60 years of age and then declined.

In 77 percent of the men and 64 percent of the women, onset of symptoms was associated with a knee injury ( $P < 0.01$ ). This sequence was seen almost uniformly in all the physically active age groups in the men. In contrast, the women had a definite peak incidence in the 20-29-year-old age group (Table 2).

There were 73 percent medial and 27 percent lateral lesions. The men sustained more bucket-handle lesions than the women. On the other hand, in the women there was a preponderance of peripheral detachments (Table 3). Bucket-handle lesions—in contrast to peripheral detachments—were related to trauma ( $P < 0.001$ ; Table 3).

Sports injuries accounted for 38 percent of the total number of lesions and for 52 percent of the lesions caused by a knee injury. In 11 percent of the patients, operations were performed on knees with damage (earlier or recent) to the anterior cruciate ligament. In 1.2 percent, there was a concurrent fracture of the femoral or tibial condyles.

Seventy-nine percent of the meniscal lesions were treated with a total meniscectomy and 19 percent with a partial meniscectomy, whereas 0.7 percent were repaired.

## Discussion

Epidemiologic studies on meniscal lesions are hampered by the fact that probably many such lesions are never recognized, for meniscal tears do not necessarily present with characteristic symptoms,

Table 2. Traumatic origin (percentages) of meniscal lesions in 1,215 patients according to sex and age groups

Age groups	0-19	20-29	30-39	40-49	≥ 50	All ages
Males	83	83	80	71	64	77
Females	71	81	61	61	51	64
All	77	83	75	68	57	73

and some may heal spontaneously. Some patients do not seek medical assistance, but accept their discomfort, often having reduced their physical activity (Hede et al. 1990).

Epidemiologic studies on treated meniscal lesions in adults have not been published before; but in cross-sectional studies, a preponderance in men has been demonstrated and explained by differences in exposure to trauma (Barfod and Bierring 1956, Johnson et al. 1974).

Nowadays, meniscal lesions tend to appear later in life than earlier (Barfod and Bierring 1956). Upon reviewing 6,500 meniscectomies performed from 1940 through 1965, Smillie (1967) found that the mean age of the patients rose from 28 to 40 years during the 25-year period.

The excess of bucket-handle lesions in males as compared with females accords with Shakespeare and Rigby (1983), and has been related to more frequent exposure to trauma (Smillie 1967), also in cases with concurrent damage to the anterior cruciate ligament (Patersson and Trickey 1983). A traumatic etiology of lesions, however, did not explain this difference between men and women.

All the operations in our study were open. The 3 years selected in the early 1980s for study have been chosen because the introduction and rapid expansion of arthroscopic surgery will prevent reliable future epidemiologic assessment, as this surgical technique is now being performed in numerous private clinics.

Although not known, it appears likely that the number of surgically treated meniscus lesions has

Table 3. Classification (percentages) of 1,215 meniscal lesions according to sex and trauma. Meniscal cysts, discoid tears, and meniscal lesions that could not be classed are grouped as "Others"

Types of lesion	Bucket-handle	Peripheral	Horizontal	Parrot-beak	Contusion	Others	Total
Males	35**	31*	2.5	14	4.0	14	100
Females	21**	41*	3.0	12	7.0	16	100
Traumatic	35**	34	2.2	12	3.5	13	100
Nontraumatic	18**	35	3.7	15	8.8	20	100
All	30	34	2.6	13	4.9	15	100

\*\* $P < 0.001$ ; \* $P < 0.01$ .

increased following the introduction of arthroscopic techniques (Abdon and Bauer 1989), because it has made possible diagnosis and minor meniscal repairs on an outpatient basis. Diagnosing meniscal disorders by an arthrotomy is less accurate than when made through the arthroscope (De Haven and Collins 1975).

The arthroscopic technique and the assumption that partial resection is superior to total removal (Gillquist et al. 1982, McGinty et al. 1977) will restrict total meniscectomy and promote surgical repair (Hamberg et al. 1983, Miller 1988).

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