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HAEMANGIOMA OF THE KNEE JOINT

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Haemangiomas are vascular malformations which usually develop during early childhood. They are fairly common on the limbs, but seldom, involve the joints.

According to their situation, the haemangiomas affecting the region of the knee may be divided into juxta-articular situated outside the joint capsule but in relation to it, intra-articular situated within the joint capsule, and intermediate which are of an intra- as well as extra-articular situation (7, 10). The intra-articular and intermediate haemangiomas generally involve the synovial membrane.

The first case of synovial haemangioma was described by *Bouchut* in 1856 (5). In 1939 *Bennett & Cobey* (2), on the basis of the 29 cases published up till then, could distinguish between two types of synovial haemangioma, diffuse and circumscribed. The diffuse type usually consisted in a cavernous haemangioma giving rise to the typical, intermittent pain and swelling in the joint. Circumscribed haemangiomas were often in the form of a pedunculated synovial tumour and of the capillary type. Episodes of locking were characteristic. In 1959 *Lewis, Coventry & Soule* (9) published 11 cases treated in the Mayo Clinic during the period 1907 to 1956. Their findings confirmed in all essentials *Bennett & Cobey's*. The total number of published cases now numbered 58.

Since that time another 17 synovial haemangiomas have been reported (1, 6, 7, 8, 10–17), bringing the total up to 75. Of these haemangiomas 1 affected the elbow joint, one the ankle joint (9), while the remaining 73 were situated in or at the knee joint.

It is the object of the present paper to report another 7 cases of synovial haemangioma in the knee joint and 12 cases of juxta-articular

haemangioma at the same joint. The symptoms and signs in the two groups, the differential diagnosis, and the treatment will be discussed.

MATERIAL

During the period 1937 to 1966 operations were performed on 19 haemangiomas in the region of the knee.

In 7 cases the haemangioma involved the synovial membrane. In one of these cases the haemangioma was intra-articular and in 6 cases intermediate.

In 12 cases the haemangioma was juxta-articular.

Out of the 7 synovial haemangiomas 4 were found in females and 3 in males. Out of the 12 juxta-articular ones 3 affected females and 9 males.

Table 1 gives the patients' ages at the first symptom. It will be seen that the complaints started with almost equal frequency all through childhood. However, 3 of the juxta-articular haemangiomas did not give rise to symptoms until the patients were 16, 30, and 44 years of age.

Table 1. Age at onset of symptomes in 19 cases of knee joint haemangioma.

	Total number of cases	<1 year	1–5 years	6–10 years	11–15 years	>15 years
Synovial haemangioma	7	2	1	2	2	0
Juxta-articular haemangioma	12	1	2	4	2	3

Table 2. The clinical features of knee joint haemangioma.

	Total number of cases	Mean duration of symptoms when first seen	History of trauma	Pain and swelling	Intermittent symptoms	Locking
Synovial haemangioma	7	4 years	2	7	6	1
Juxta-articular haemangioma	12	3 years	3	8	8	1

From Table 2 it is apparent that the nature of the symptoms was approximately the same, whether or not the haemangiomas involved the synovial membrane, and in both groups the patients had been suffering from the symptoms for an average of 3–4 years when they were referred to us. It must be mentioned, however, that intermittent pain and swelling in the joint were present in nearly all the synovial haemangiomas, while these symptoms were less common in the juxta-articular haemangiomas. Two patients had a history of locking. One proved to have a diffuse

synovial haemangioma, the other one a juxta-articular haemangioma localized beneath the vastus medialis. The aetiology of the locking is obscure.

The physical signs are listed in Table 3. In 2 of the synovial haemangiomas there was swelling of the joint which was never present in juxta-articular haemangiomas. In addition, pain and limited mobility were considerably more common in synovial haemangiomas. In the only case where a juxta-articular haemangioma gave rise to limited motion there was a question of a large haemangioma in the vastus medialis, and this caused a moderate restriction of flexion. Of the 4 cases where a synovial haemangioma restricted the mobility, this restriction was moderate in 3 cases, while in one it was pronounced owing to violent, destructive osteoarthritis in the joint. Muscular atrophy was also a relatively common finding in synovial haemangioma. In most of the patients a mass was palpable in the region of the knee. As a rule, the masses were soft and ill-defined. Among the synovial haemangiomas a palpable mass was present in 4. Two of these masses were tender. In juxta-articular haemangioma there was a palpable mass in 8; 3 were tender. In 3 instances the tenderness was not present especially on a level with the mass, being more diffuse in the region of the knee.

Table 3. The physical signs of knee joint haemangioma.

	Total number of cases	Joint swelling	Pain on motion	Limitation of motion	Mass	Tenderness	Muscle atrophy	Haemangiomata elsewhere	Leg-length discrepancy
Synovial haemangioma	7	2	5	4	4	4	5	3	1
Juxta-articular haemangioma	12	0	6	1	8	4	4	2	2

X-ray examination in 7 cases of synovial haemangioma revealed i 2 phleboliths. In one of these cases there was also destruction of the point, particularly marked in the medial tibial condyle (Figure 1). In one case there was a translucency in a femoral condyle, and in one case there was periosteal reaction distally on the femur. Among the 12 juxta-articular haemangiomas there were phleboliths and periosteal reaction distally on the femur in one (Figure 2), destructive changes in a tibial condyle in one, and periosteal reaction distally on the femur in one.

At operation, the haemangioma was in all 7 cases localized at the site of the named radiographic changes.

Arteriography was performed in 6 cases. In 3 it revealed haemangioma in the knee region and in one also arteriovenous anastomosis in the same region.

Phlebography was carried out in 2 cases. In one it showed intra-articular haemangioma (Figure 3).

In the present series the diagnosis was made preoperatively in 3 out of the 7 cases of synovial haemangioma and in 4 out of 12 cases of juxta-articular haemangioma.

Operation disclosed 7 synovial haemangiomas, one of which was in the form of a

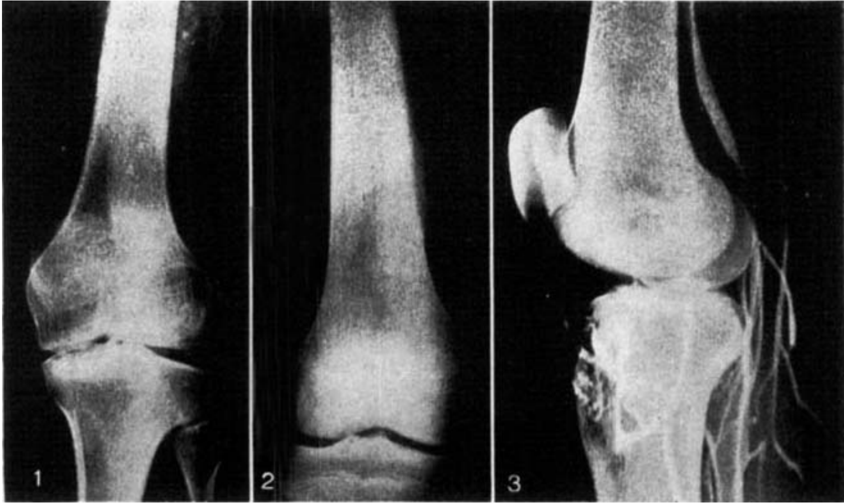

Figure 1. Synovial haemangioma with phleboliths and joint destruction.
Figure 2. Juxta-articular haemangioma with phleboliths and periosteal reaction.
Figure 3. Phlebography of intra-articular haemangioma.

circumscribed, intra-articular, non-pedunculated synovial tumour, while 6 were intermediate haemangiomas of the diffuse type, penetrating the joint capsule and spreading without any sharp demarcation into the surrounding tissue. In 4 cases they involved the quadriceps muscle, in 2 only the skin and subcutaneous tissue. While the circumscribed haemangioma could be removed radically without any difficulty, this was not possible in the case of the 6 diffuse ones. In one of these cases there was violent destruction of the joint, and arthrodesis was performed.

Operation disclosed 12 juxta-articular haemangiomas, in an extra-articular situation, but in relation to the knee-joint capsule, 7 of these haemangiomas were circumscribed, while 5 were diffuse. Out of the diffuse haemangiomas 3 involved the quadriceps muscle, 1 the popliteal bursa, and 1 exclusively the subcutis. In this group too, radical surgery was possible only in the case of circumscribed haemangiomas.

On pathological examination 5 out of the 7 synovial haemangiomas, including the circumscribed one, could be classified as cavernous, 1 was capillary, and 1 a fibro-haemangiomas cavernosum. Out of the 12 juxta-articular haemangiomas 11 were examined histologically, and all were found to be of the cavernous type.

The postoperative follow-up period for synovial haemangiomas ranges from 3 months to 12 years, average 3 years. There have been two recurrences. One occurred about 10 years after the operation and was re-operated with a good result. The other recurrence appeared 4 years after the operation and was treated with X-rays. The patient has now been symptom free for 2 years.

The juxta-articular haemangiomas have usually been followed for only a few months after the operation, so that it is not possible to asses the recurrence rate.

DISCUSSION

Synovial as well as juxta-articular haemangiomas are rare, and this is no doubt the explanation why they are so seldom diagnosed preoperatively in spite of the characteristic syndrome. In the present material, for instance, synovial haemangiomas were diagnosed preoperatively in only 3 out of 7 cases and in *Lewis, Coventry & Soule's* series in 3 out of 11 cases (9).

With the present material the total number of published cases of synovial haemangiomas is brought up to 82. It is worth noting that in 80 of these cases the haemangioma has affected the knee joint.

The typical patient with synovial haemangioma is a child who has for some years had intermittent pain and swelling of a knee joint. The symptoms are usually not preceded by trauma. In most cases a soft, diffuse, and at times tender mass is palpable in the region of the knee. As a rule there is pain on moving the joint and often a somewhat restricted mobility. Muscle atrophy is a common finding. Not infrequently, there are haemangiomas of the skin in other sites. X-ray examination occasionally shows phleboliths and possibly destructive changes or periosteal reaction of the bone at the site of the haemangioma. Articular destruction also occurs.

The symptoms and signs of juxta-articular haemangioma do not differ much from the above description, and often the differential diagnosis, with a view to the localization of the haemangioma in relation to the synovial membrane, causes difficulties. If there is swelling in the joint, and in particular if joint puncture yields blood, the haemangioma of course involves the synovial membrane. In the event of considerably restricted motion and muscle atrophy, there is presumably also a question of synovial haemangioma. Otherwise, the only means of determining the accurate site of the haemangioma in fairly early cases is arteriography or phlebography.

If there is an arteriovenous shunt in connection with the haemangioma, the limb on the affected side may be lengthened and the symptoms and signs on the whole characterized by the increased arteriovenous flow. It is of the utmost importance to diagnose such shunts preoperatively. Therefore, arteriography should invariably be done if there is a suspicion of haemangioma. Plethysmographic investigation too will frequently afford valuable preoperative information (4).

In respect to the prognosis in untreated cases it is of essential importance that owing to the ever recurring haemorrhage in the joint,

the synovial haemangioma may lead to considerable destruction in the joint, similar to that seen in haemophiliac patients (2). The present material includes one such case in which the articular destruction was so advanced that arthrodesis had to be done.

Accordingly, the synovial haemangiomas should be treated at a stage as early as possible. In juxta-articular haemangiomas the indication is not quite so clear, and in the event of mild symptoms it may be justified to await spontaneous remission.

In circumscribed haemangiomas radical surgery is possible, and in these cases surgery gives good results (9). In diffuse haemangiomas radical operation is very difficult (2). The present material includes 11 haemangiomas of the diffuse type, and none could be treated radically. In diffuse haemangiomas, therefore, X-ray irradiation is indicated, postoperatively or as the only treatment (2, 3). In the present material one recurrence of synovial haemangioma was successfully treated by X-ray irradiation.

SUMMARY

During the period 1937 to 1966 a total of 19 cases of haemangioma in the region of the knee were treated by operation. 7 haemangiomas involved the synovial membrane. In 18 cases microscopic examination of the haemangiomas was done. One was classified as capillary, whereas the remainder were of the cavernous or predominantly cavernous type.

The typical symptoms and signs of synovial and juxta-articular haemangioma are described (Tables 1, 2, and 3).

In localized haemangiomas surgical treatment gives good results, but in the diffuse cases radical surgery is seldom possible. In such cases X-ray irradiation is used, either postoperatively or as the only treatment.

RESUME

Au cours de la période 1937 à 1966 un total de 19 cas d'hémangiome dans la région du genou ont été traités chirurgicalement. 7 hémangiomes atteignaient la membrane synoviale. Dans 18 cas, il a été effectué un examen microscopique de l'hémangiome. L'un a été classifié comme capillaire, alors que tous les autres étaient du type caverneux ou avec prédominance du type caverneux.

Les symptômes typiques et les signes d'hémangiome synovial et juxta-articulaire sont décrits (Tableaux 1, 2 et 3).

Lorsque l'hémangiome est localisé, le traitement chirurgical donne

de bons résultats, mais dans les cas diffus, une intervention radicale est rarement possible. Dans ces cas, on a recours à l'irradation aux rayons X soit après l'opération, soit comme unique traitement.

ZUSAMMENFASSUNG

Während des Zeitraumes 1937 bis 1966 wurden insgesamt 19 Fälle von Hæmangiom der Knieregion operativ behandelt. 7 Hæmangiome umfassten die Synovialmembran. In 18 Fällen wurde eine mikroskopische Untersuchung des Hæmangiomes vorgenommen. Eines wurde als Kapillarhæmangiom klassifiziert, während die übrigen von kavernöser oder vorherrschend kavernöser Type waren.

Die typischen Symptome und Zeichen von synovialen und juxtaartikulären Hæmangiomen werden beschrieben (Tabelle 1, 2 und 3).

Bei lokalisierten Hæmangiomen führt die chirurgische Behandlung zu guten Ergebnissen, in diffusen Fällen ist radikale Chirurgie jedoch nur selten möglich. In solchen Fällen wird Röntgenbestrahlung entweder postoperativ oder als alleinige Behandlung verwendet.

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