CASE REPORT

Discoid meniscus associated with agenesis of the anterior cruciate ligament in an 8-year-old child

M. Rayar, J. Bouillis, B. Fraisse, S. Marleix, M. Chapuis, P. Violas* 

Department of Pediatric Surgery, South Hospital, boulevard de Bulgarie, 35200 Rennes, France

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KEYWORDS

Agenesis of the anterior cruciate ligament; Discoid meniscus; Meniscal cyst

Summary

Among the congenital anomalies involving the lateral compartment of the knee, the combination of both a discoid meniscus and agenesis of the anterior cruciate ligament (ACL) is extremely rare and probably underestimated due to the presence of a meniscofemoral ligament often mistaken for an intact ACL. The therapeutic management of such abnormalities is not univocal and highly depends on their clinical impact. We report on the observations of an 8-year-old boy presenting with a cystic formation on a lateral discoid meniscus associated with agenesis of the ACL and the presence of an anterior lateral meniscofemoral ligament.

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Introduction

Discoid meniscus is the most common congenital anomaly of the meniscus in children. It typically affects the lateral meniscus (0.4 to 17%) [1] and less commonly involves the medial meniscus (0.06 to 0.03%) [1, 2]. It is found bilaterally in about 20% of the cases [1]. The clinical impact of discoid meniscus is variable and this condition may remain unidentified since some anatomic variants are asymptomatic. The combination of a discoid meniscus and meniscal cyst is found in about 8% of the cases [3]. Agenesis of the anterior cruciate ligament (ACL) is an extremely rare clinical entity (0.0017 out of 1000 births) [4], which may be underestimated since it may not have any clinical impact or due to the presence of an anterior lateral meniscofemoral ligament often mistaken for an intact ACL on radiographic images. Agenesis of the ACL may be associated with other pathological findings such as hypoplasia of the femoral condyle, shallow intercondylar notch or agenesis of the tibial spines [4, 5]. Conversely, this condition is more rarely combined with a discoid meniscus [4–7].

The authors report the case of an 8-year-old child who presented with a symptomatic meniscal cyst formation combined with a discoid meniscus. Arthroscopic examination revealed agenesis of the ACL with a meniscofemoral ligament mimicking the course of an intact ACL.

Observation

An 8-year-old boy presented with a 2-year history of swelling in the lateral compartment of his knee. This initially asymptomatic mass had recently increased in size and was associated with pain during sporting activities. On examination, a tumefaction facing the lateral tibiofemoral joint...
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The incidence of ACL agenesis is probably underestimated due to its frequent asymptomatic occurrence and the possible presence of a meniscofemoral ligament. The meniscofemoral ligament is a fibrous anatomical structure stretched between the anterior horn of the meniscus and the posterolateral aspect of the intercondylar notch, as described by Silva and Sampaio [7].

The combination of a discoid meniscus and ACL agenesis has rarely been described in the literature. Noble [6] was the first in 1975 to report the association of both these anomalies during the autopsy of an 85-year-old man who had died of bronchopneumopathy and presented a ring-shaped discoid meniscus associated with ACL agenesis. This patient had an asymptomatic knee before he died. Manner et al. [4] in 2006, report in their series three cases of discoid meniscus (one lateral, one medial and one bilateral) associated in all cases with a type III ACL agenesis. Finally, Silva and Sampaio [7] have described the combination of a ring-shaped discoid meniscus and ACL agenesis as well as a meniscofemoral ligament identified in a 13-year-old girl.

In our observation, the patient had a type I discoid meniscus according to the Watanabe classification associated with a meniscal cyst and a type I ACL agenesis according to the various classifications that have been proposed, the Watanabe classification is the most commonly used [10]. It is based on arthroscopic findings and describes three subtypes of lateral discoid menisci: Type I and II are used to describe complete and incomplete discoid menisci depending on the degree of tibial plateau coverage and feature normal peripheral attachments. The Wrisberg-type (type III) discoid meniscus is defined by the absence of the posterior attachment to the tibia thus responsible for hyper-mobility. Montlau et al. [11] have extended this classification by adding a fourth sub-type of discoid meniscus having a “ring shape”. However, this classification does not take into account the absence of attachments except for the posterior one. In a series of Klingele et al. [12], peripheral instability was found in 28% of the cases of which 47% of anterior instability versus 39% of posterior instability and 11% of medial instability. These findings were confirmed by Good et al. [13] who even reported higher rates thus suggesting the use of a new classification system based on the complete or incomplete pattern of the meniscus and the presence or not of instability [13]. Surgical treatment should be considered in case of clinical impact and, as suggested by Gicquel et al. [14], will consist in restoring the physiological shape of the meniscus by resection of the injured areas. Meniscal resection should be systematically carried out using the most sparing technique in order to prevent arthritic events in the long term. In children as well as in adults, this surgical management should be arthroscopically performed since unstable menisci require suture fixation of soft tissues for proper stabilization.

Agensation of the ACL may be identified through the appearance of knee instability symptoms or may remain asymptomatic. It may be associated or not with a posterior cruciate ligament (PCL) abnormality, thus defining the basis of the Manner classification [4]. An isolated ACL lesion (hypoplasia or aplasia) corresponds to type I, LCA impairment associated with PCL hypoplasia corresponds to type II whereas aplasia of both the ACL and PCL ligaments corresponds to type III.

The discoid meniscus was first described by Young in 1889 [10]. It may appear asymptomatic but the occurrence of a meniscal tear is usually associated with symptoms such as pain, snapping knee or limited knee extension. Among the possible causes of discoid meniscus are trauma and congenital anomalies. Trauma is an infrequent cause of discoid meniscus and should not be confused with congenital discoid meniscus which is frequently asymptomatic. A congenital discoid meniscus is defined by the absence of the posterior attachment to the tibia thus responsible for hyper-mobility. The discoid meniscus was first described by Young in 1889 [10].

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Figure 1 Frontal MRI T2 weighted image of the left knee. Meniscal cyst in lateral discoid meniscus.

Discussion

The discoid meniscus was first described by Young in 1889 [10]. It may appear asymptomatic but the occurrence of a meniscal tear is usually associated with symptoms such as pain, snapping knee or limited knee extension. Among
Manner classification and reported the presence of a meniscofemoral ligament. The discoid meniscus and ACL agenesis were both asymptomatic. The meniscal cyst was the only indication for surgical treatment.

Conclusion

Our observation reveals the presence of congenital intra-articular knee anomalies in an asymptomatic child with no evidence of antero-posterior instability. The combination of a type I ACL agenesis according to Manner (with a meniscofemoral ligament) and a type I discoid meniscus according to Watanabe (with meniscal cyst) is thus reported for the first time in the literature. Care should be taken by the physician to perform a thorough analysis of the MR images necessary when assessing a congenital abnormality of the meniscus and to keep in mind this possible association. Once the diagnosis has been made, management by ligament reconstruction should be discussed depending on the symptomatology.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References