

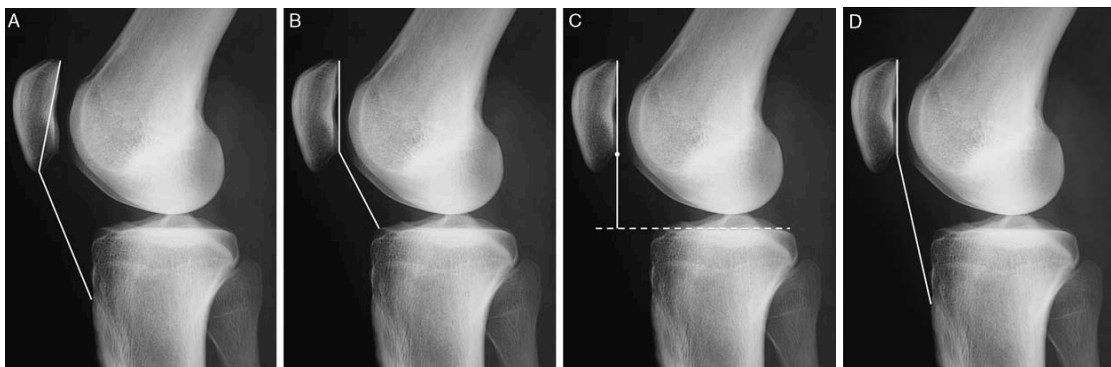
Role of Patella Alta in Recurrent Patellar Instability

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Patella alta has long been recognized as a risk factor for recurrent patellar instability. It is important to understand that patella alta is the result of a long patellar tendon rather than a more proximal insertion of the tendon on the tibia.(1) Patella alta means that the patella will engage in the trochlea later in flexion, making the patella more susceptible to lateral dislocation in early flexion. This can be exacerbated by a short and/or dysplastic trochlea.

Patellar height is typically measured on lateral X-rays with the knee in 20 to 30 degrees flexion. Various indices have been described. The Caton-Deschamps (C-D) and Blackburne-Peel (B-P) indices use the length of the patellar articular surface relative to the distance from the distal end of the patellar articular surface to either the plane of the tibial plateau, or to the anterosuperior corner of the tibia, respectively. The Insall-Salvati (I-S) index and the modified Insall-Salvati (ml-S) index use the length of the patellar tendon relative to the length of the patella or the articular surface of the patella, respectively. The I-S and ml-S indices cannot be used to measure the effect of tibial tubercle distalisation because the length of the patellar tendon is not changed.



A: Insall-Salvati, B: Caton-Deschamps, C: Blackburne-Peel, D: modified Insall-Salvati

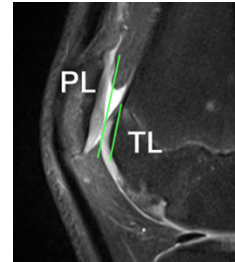
Although satisfactory inter-observer reliability has been reported for individual indices, there is considerable variation between indices in terms of the number patellae classified as normal, low or high.(2, 3) The indices (C-D and B-P) that use the length of the articular surface as a reference appear to be reasonably similar in terms of classification of patellae as normal, alta and baja. Whichever index is used, it is however important that the knee is in enough flexion, typically 20 to 30 degrees, to have tension in the patellar tendon. If the patellar tendon is lax, the patella may sit more distally, leading to an underestimation of patellar height.



With the increasing availability of MRI it has also been used to assess patellar height. Satisfactory correlation between plain radiographic and MRI measurements of the C-D index has been reported.(1) However, when using MRI to assess patellar height,

consideration needs to be given to which sagittal slice to use. A slice that is too lateral may give the appearance of a shorter patella and therefore of patella alta. Thus, the slice that gives the longest length of the patellar articular surface is preferable. As with plain radiographs, the knee needs to be enough knee flexion to ensure that there is adequate tension in the patellar tendon.

More recently, MRI has been used to evaluate of the engagement of the patella in the trochlea in the sagittal plane.(4) There appears to be a group of patients with patellar instability in whom there is reduced engagement of the patella in the trochlea in early knee flexion but without obvious patella alta. However, patellar-trochlear indices are not yet in widespread clinical use.



Since the rise in popularity of MPFL reconstruction and the reporting of its effectiveness,(5, 6) algorithms for surgical management of patellar instability have changed. The previous *a la carte* approach may no longer be applicable, particularly if MPFL reconstruction is regarded as the basis of surgery. The principal issue becomes when to add an additional procedure, typically a tibial tubercle osteotomy (TTO). With the move to MPFL reconstruction, tibial tubercle medialisation is now less frequently performed and, if one increases the threshold for the tibial tubercle-trochlear groove (TT-TG) distance just a few millimetres, rarely indicated. Distalisation is becoming the main reason to perform a TTO. Nonetheless, medialisation of the tibial tubercle is still performed by many and some surgeons are cautious about distalisation because of an apparently greater risk of non-union and concerns about inadvertently producing patella baja. In the setting of significant patella alta, medialisation of the tibial tubercle with or without a MPFL reconstruction may not be enough to achieve stability.

In the author's practice, the majority of patients with recurrent patellar instability, are treated with a MPFL reconstruction in isolation or combined with a distalising TTO. Other procedures such as trochleoplasty, lateral retinacular lengthening or release and femoral osteotomy are generally only required in more complex situations such as habitual dislocation or chronic dislocation. However, it should be noted that this applies to "typical" cases of recurrent patellar instability and that even in these scenarios, many factors need to be taken into account, such as whether the problem is primarily dislocation or subluxation, the presence and severity of J-tracking on clinical examination, and the degree of trochlear dysplasia. When one is dealing with less common and more complex cases such as chronic dislocation or habitual dislocation, centering the patella in the trochlear groove is the first priority and this determines what procedures need to be employed.

The author's approach is, where possible, to use an isolated MPFL reconstruction as surgery to treat recurrent patellar instability. In determining whether an additional procedure may be required, key clinical features are whether the presenting problem is primarily recurrent subluxation or dislocation, whether J-tracking is present and the degree of patella alta. Recurrent dislocation and/or the presence of J-tracking in the presence marked patella alta ($C-D > 1.3$, $I-S > 1.4$) are relative indications for an

additional TTO, usually distalising. J-tracking in itself is regarded as an indication that a bony procedure is likely to be required to achieve patellar stability.

References

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