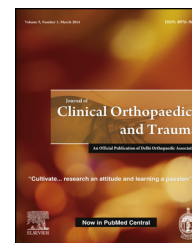


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## Review Article

## Habitual dislocation of patella: A review



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## ABSTRACT

Habitual dislocation of patella is a condition where the patella dislocates whenever the knee is flexed and spontaneously relocates with extension of the knee.

It is also termed as obligatory dislocation as the patella dislocates completely with each flexion and extension cycle of the knee and the patient has no control over the patella dislocating as he or she moves the knee<sup>1</sup>. It usually presents after the child starts to walk, and is often well tolerated in children, if it is not painful. However it may present in childhood with dysfunction and instability. Very little literature is available on habitual dislocation of patella as most of the studies have combined cases of recurrent dislocation with habitual dislocation. Many different surgical techniques have been described in the literature for the treatment of habitual dislocation of patella. No single procedure is fully effective in the surgical treatment of habitual dislocation of patella and a combination of procedures is recommended.

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## 1. Introduction

Habitual dislocation of patella is a condition where the patella dislocates whenever the knee is flexed and spontaneously relocates with extension of the knee.

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Very little literature is available on habitual dislocation of patella as most of the studies have combined cases of

recurrent dislocation with habitual dislocation. Many different surgical techniques have been described in the literature for the treatment of habitual dislocation of patella. No single procedure is fully effective in the surgical treatment of habitual dislocation of patella and a combination of procedures is recommended.

## 2. Presentation

Lateral dislocation or subluxation of the patella in children can present in three different forms. It can be recurrent when dislocation is episodic, habitual when it occurs during each flexion movement of the knee and permanent when it persists in all positions of the knee.<sup>2</sup>

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The displacement is painless in habitual dislocation, in marked contrast to recurrent dislocation which occurs as isolated episodes, often in response to trauma and is accompanied by pain and swelling. Permanent dislocation is usually congenital and refers to an irreducible dislocation present since birth and associated with a lateral position of the entire quadriceps mechanism. The distinction between these groups is important as the surgical treatment for each group is quite different.<sup>3</sup>

Habitual dislocation of patella is never obvious in the young, fat-covered knee and may be missed unless actively sought.<sup>2–5</sup> It usually presents after the child starts to walk, and is often well tolerated in childhood. It is usually asymptomatic and is often detected by the parents as an odd looking knee or is detected on routine examination in many children. However it may present in childhood with features of dysfunction and inability to run because of instability.<sup>3,4</sup>

It is usually symptomatic when detected in adults with major symptom of patella-femoral pain and weakness during running or climbing stairs, crepitus, and joint effusion.<sup>6</sup>

The cardinal physical sign in habitual dislocation is that if the patella is forcibly held in the midline it is impossible to flex the knee more than 30–70°. Further flexion is then possible only if the patella is allowed to dislocate, when a full range of motion is readily obtainable.<sup>3,4</sup>

### 3. Pathophysiology

Various pathological factors have been described in the pathogenesis of habitual dislocation of patella. The most important factor is contracture of soft tissues lateral to patella.

Jeffreys in 1963 described an abnormal attachment of the iliotibial tract to the patella, producing habitual dislocation in flexion.<sup>7</sup> Later, Gunn in 1964 described the association of quadriceps fibrosis with intramuscular injections to the thighs. He also put forward the idea that quadriceps contracture may sometimes give rise to dislocation of the patella.<sup>8</sup> This association was later confirmed by Gammie (1963), Lloyd-Roberts and Thomas (1964), Williams (1968) and Alvarez et al. (1980).<sup>4,9–11</sup> Groves and Goldner in 1974 described that local trauma of the injection itself could produce muscle necrosis and fibrosis and, introduction of large volumes of liquid could produce raised pressure within muscle bundles resulting in capillary obstruction, oedema and muscle ischaemia. The irritant quality of the solution varied with its components, pH and osmotic pressure.<sup>12</sup>

The histological studies in cases of habitual dislocation of patella have consistently shown degeneration of striated muscle and replacement with varying amounts of fibrous and adipose tissue.<sup>9–11,13</sup> An MRI study performed on 28 patients with recurrent or habitual dislocation found signs of fibrosis of the vastus lateralis in patients with insidious onset of dislocation. It was not seen in cases with history of trauma. The fibrosis was evident as low signal intensity cords on T2 weighted images. Histological examination in these cases revealed inflammatory cell infiltration, fibrosis and muscle fibre degeneration.<sup>14</sup>

Williams reported clinical presentations and pathophysiology in patients with quadriceps contractures. He reported that quadriceps contracture patients may present in a variety of ways. At birth they may present with a stiff extended knee or congenital recurvatum or congenital dislocation. In later

childhood they present with habitual dislocation of the patella. In adults there may be a painful knee due to habitual dislocation and arthritis. He reported that his patients with habitual dislocation had contractures of all parts of quadriceps except vastus medialis. The contractures were mainly seen in the vastus lateralis (the main contributor in over half the cases) and rarely in the iliotibial band or rectus femoris. Stretching of the vastus medialis tendon was associated with the laxity of the medial capsule in these patients. Abnormal bands and connections in the tendinous insertion of the quadriceps were found, and were thought to be of congenital origin. Other abnormalities including a shallow femoral groove, hypoplastic lateral femoral condyle, and lateral insertion of the patella tendon were also noted. A number of patients had history of intramuscular injections in the thigh in the neonatal period leading to contractures later on. Late presentation in all these cases was caused by unequal growth of muscle and bone so that the effect on the knee was not apparent for a number of years. Most cases presented between the ages of 5 and 12 years when the femur is growing disproportionately to the quadriceps. Family history of dislocation was positive in a few patients and other abnormalities were noticed in some cases.

He also noted that quadriceps fibrosis involving the rectus femoris and vastus intermedius alone would result in an elevated and hypoplastic patella. When the vastus lateralis and the iliotibial tract are involved there is great tendency for habitual dislocation of the patella to occur on flexion of the knee. He noted that habitual dislocation was not seen in all cases in which vastus lateralis and the iliotibial tract were contracted. Whether or not habitual dislocation occurred depended on factors extrinsic to the quadriceps such as femoral torsion, dysplasia of the lateral femoral condyle, genu valgum, a laterally placed patellar tendon insertion and ligamentous laxity.<sup>3,4</sup>

Bakshi described the difference in the pathology of recurrent and habitual dislocations. In recurrent dislocations, there were no contractures of the soft tissue lateral to the patella, but medial stabilisation was found to be weak. In habitual dislocation, where flexion of the knee was always associated with displacement of the patella, both lateral contractures and medial laxity were present. Genu valgum, defects of the patella and femoral condyles were also present in a few cases of habitual dislocations. He noted that in recurrent dislocation, the medial stabilization of the patella was poor because of weakness of the vastus medialis, dysplasia, generalized joint laxity, or post traumatic medial capsular laxity. In habitual and permanent dislocations of patella, the supero-lateral muscle contracture was the primary pathology. Whether it was idiopathic or due to injection fibrosis; medial laxity or weakness of the medial stabilizers of the patella was secondary.

He noted that a number of bony deformities can be associated with dislocations of the patella, but may not be the actual cause. Corrective osteotomy for genu valgum associated with lateral dislocation of the patella, often failed to control the dislocation; and many patients with severe genu valgum did not suffer from dislocation of the patella. Bone factors probably had only a small role in the dynamic stability of the patella. EMG studies of vastus lateralis, vastus medialis and pes anserinus muscles were performed in all cases. Weak activity of vastus medialis and fair activity of the vastus lateralis was seen in patients with habitual dislocations.<sup>2,15</sup>

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