# Use of Percutaneous Needle Tenotomy for Treatment of Congenital Knee dislocation

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**Abstract**

Quadriceps muscle contracture is the main pathology in cases of congenital dislocation of Knee. This can be easily accessed and released through percutaneous approach using a wide bore needle. This technical note describes the technique in details. It is a simple technique with minimum complications and gives good results in selected cases.

**Keywords:** congenital dislocation of knee, percutaneous needle tenotomy; quadriceps tenotomy.

## Introduction

Congenital dislocation of knee (CDK) is a rare disorder and main pathology described is contracture of the quadriceps tendon [1,2]. In our observation CDK are of three types viz. stiff variety – where minimal correction is possible; partially correctable – where deformity can be passively corrected to a significant degree however correction beyond neutral is not possible; and Hypermobile- where although the joint dislocates, the relocation is possible and knee can be flexed beyond 90º of flexion. The three class differ in the severity of the pathological changes and stiff variety indicates a more widespread contracture (most likely a syndrome association) while hypermobile variety is more a representation of ligament laxity than contracture. The partially correctable variety has contracture that is limited mostly to the quadriceps tendon and this is the variety that we found is most amenable to percutaneous needle tenotomy. We here describe the technique and provide the video of the same.

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## Technical Note

For this technique we selected only the 'partially correctable' variety of CDK. The age to perform correction is as early as possible and we have performed this procedure in cases with failed plaster (serial cast) treatment and also in delayed presentation till 6 months of age.

Technique (Video 1): Two weeks old male child with bilateral congenital knee dislocation presented to us (Fig 1). The deformity was partially correctable ie it could be corrected till neutral but not beyond (Fig. 1c). The baby was placed in supine position under isoflurane mask anesthesia. The knee was prepared and painted and all aseptic precautions taken. Percutaneous needle tenotomy was performed using a wide bore needle, preferably a 16 gauge needle (guided by size of the baby). To begin the procedure, assessment of knee was done again and tensed cord like quadriceps tendon was appreciated on attempted correction of the deformity. In these cases a skin crease can be appreciated above the patella and is due to the recurvatum deformity (Fig 1c). The knee was held in slightly overcorrected position to make the quadriceps tendon tight and easily palpable. Needle was inserted at about one finger breadth above the upper pole of patella (where the tight tendon is palpable). This point lies just above the anterior knee skin crease (Fig 2a). The cutting edge of the needle is used to cut through the tensed tendon and a grating sensation




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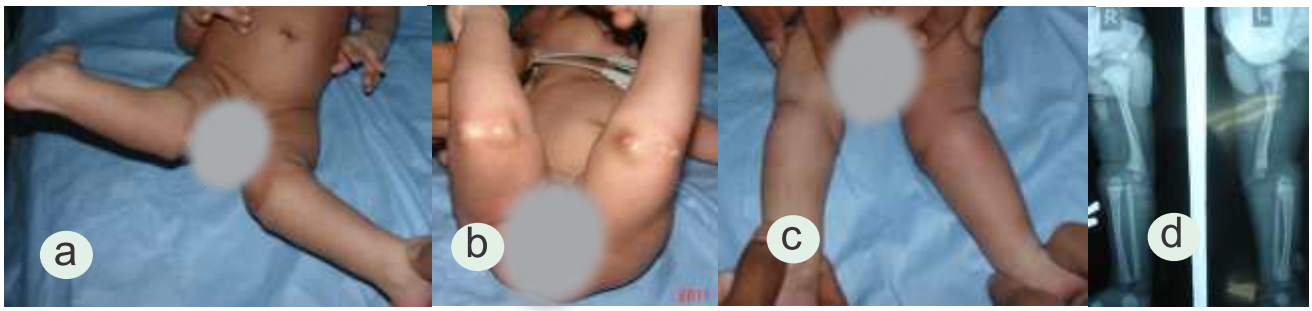


Figure 1: a- Clinical picture of the child showing bilateral congenital knee dislocation. b-Viewed form the posterior aspect the femoral condyles can be seen bulging into the popliteal fossa. c-Flexible deformity that could be corrected till near neutral. d-radiograph confirming dislocation at both knee joints.

can be appreciated. Progressive tension is applied by the other hand to continue flexion of the knee. This further tenses the deeper fibers which can then be cut by the needle tip to allow further correction. the medial and lateral retinacular fibers also require to be released by moving the needle tip in these directions (Video 1). After complete release of central tendon and peripheral retinacula the needle is removed. Longitudinal traction is then applied and knee was reduced. The knee could be reduced to 90º of flexion in our cases (Fig. 2b) and although knee could be dislocated, relocation was fairly easy to achieve. The procedure is simple and duration is very short taking less than a minute or two to finish. Hip spica was given in cases with bilateral release (Fig. 2c). The degree of flexion was decided based on skin blanching; however in all our cases the 90º of knee flexion was easily achievable. In unilateral cases a high above knee cast was given.

Cast was continued for 3 weeks after which a Pavlik harness was given for full time wear for 4 weeks. Intermittent removal of Pavlik harness (1 hour after every 4 hours of application) was suggested for next 4 weeks after which night only Pavlik harness was suggested for 4 more weeks. Knee physiotherapy and mobilization is started simultaneously and patients were serially followed up for assessment. Figure 3a and b show radiograph and clinical picture of the child at follow ups. In our short series of 8 patients we could achieve correction in all our selected patients with no recurrence and no complications.

Figure 2: a- Needle inserted above the skin crease. b- Correction achieved till 90º of flexion. c-Hip spica applied

Figure 3: a-Radiograph showing good reduction of the knee joints at 9 months follow up. b- Clinical picture of child standing independently at 11 months of age

## Discussion

Percutaneous needle tenotomies have been described previously for release of tight contracted tendons specially the release of tendoachilis in congenital talipes equino varus [3]. We extrapolated the principle and used it in treatment of congenital knee dislocation.

Conservative, open, semi-open and percutaneous techniques have been described for treatment of CDK with varying success rates [4,5,6]. The incidence of CDK is so low (1/100000 live births [1]) that a comparative analysis of these techniques is very difficult. Our technique of percutaneous needle tenotomy could add to the armamentarium of the

treatment modalities of CDK. The main advantage of the technique is that it is minimally invasive and even if it fails to achieve correction, other modalities can be used in the same setting to achieve correction. In our experience the complication and failure rate is low in carefully selected cases of partially correctable CDK; however a larger sample study will be needed.

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