

# IAS NEWSLETTER



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Dr. Ramakanth Rajagopalakrishnan

### BTB 2.0

## A versatile graft for ACLR

### WHY BTB?

Sufficient strength & Ribbon like configuration of native ACL. Excellent bone-bone integration within the socket by 8 weeks, Return to sports within 4-6 months.

**Indications:** Skeletally mature individuals, high performance athletes, labourers.

**Contraindications:** ACL insufficiency in adolescents, Patellar tendinitis (fibrosed tendon)

### Graft harvest pearls:

Pre-op BPTB graft templating on MRI, Mobile window technique (avoids patchy numbness), Tibial bone plug tongue extension for minimising graft length tunnel mismatch, preserving Hoffa's fat pad to avoid fluid leakage, stress free plug resection to avoid donor site fracture.

### Myths:

Patchy numbness/anterior knee pain-more with BTP graft, Anatomical reconstruction cannot be done by transtibial technique

These myths are busted & proven false!



**Dr. Arumugam**

# APLASIA OF THE ACL WITH UNUSUAL MEDIAL MENISCAL TEAR AND DEFORMITIES OF THE LIMB IN FIBULAR HEMIMELIA

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Aplasia of the ACL (ACLA) is known to have an incidence of 1.7 in 100000 live births. Fibular hemimelia is the most common cause of ACLA. Multiple deformities of the lower limb are known to occur in this condition along with absent cruciates & bony morphological changes within the knee.

lady with right knee pain with valgus deformity of the tibial shaft, an absent 5th metatarsal, splayed and uncorrectable 4th and 5th toes, the bases of both of which were articulating with the head of the 4th metatarsal. She was found to have grade 2 Lachman, anterior drawer and Pivot shift tests. CT scanogram showed a valgus deformity of proximal third tibial shaft with an angle of 4 degrees at the CORA, a dysplastic lateral femoral condyle and tibial eminence. Radiograph of the foot showed splayed 4th and 5th toes, bases of proximal phalanges of both toes articulating with the head of 4th metatarsal, and an absent 5th metatarsal(Fig1). Fibula was intact. MRI revealed an absent ACL and a bucket handle tear of the medial meniscus(Fig2).

## Case:

The case presented was that of a 22-year-old



Figure1: Clinical photographs & radiographs at initial presentation

Due to the acute pain, an arthroscopy of the knee was done and was found to have an unusual tear of the meniscus. There was a horizontal flap tear of the medial meniscus and the femoral sided flap had developed a bucket handle tear and was unstable. The meniscal tear was reduced and an outside in repair was done (Fig 2) with the help of Meniscal Menders (Smith & Nephew). ACL was reconstructed using All inside ACL Reconstruction system (Arthrex) using Semitendinosis tendon graft. At 6 weeks and 3 months follow up, her knee was stable, she had full Range of movements and mobilised full weight bearing without support.

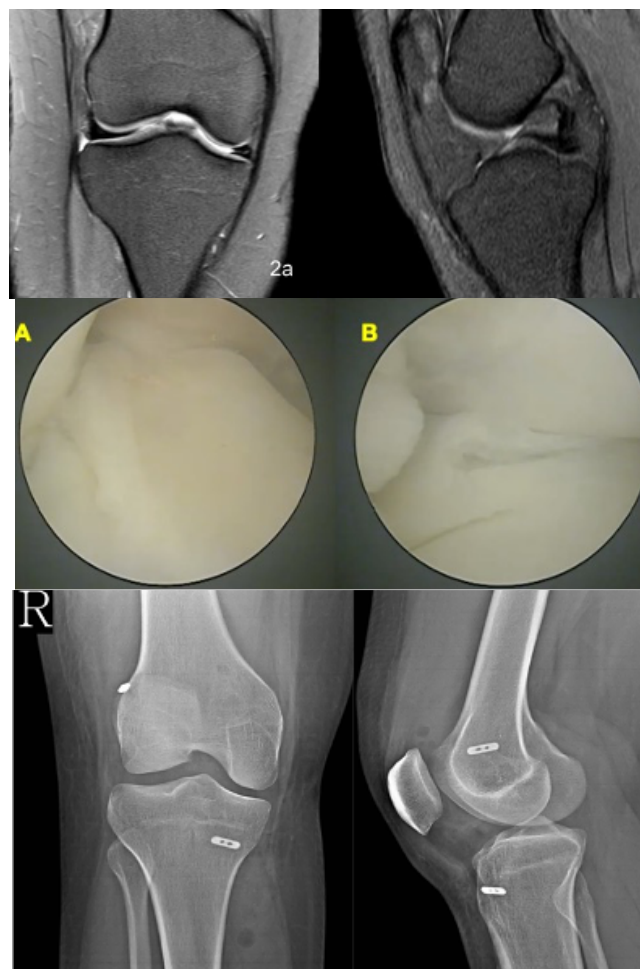


Figure 2: MRI Showing absent ACL, Arthroscopy images showing meniscal repair, Post Op Radiographs showing ACLR using all inside technique.

She presented for correction of deformities at 5 months after the first surgery. An Ilizarov fixator was placed with a hinge at the CORA of tibial deformity, an osteotomy done and limb lengthening commenced from 9th post-operative day. A closing wedge osteotomy to correct the proximal phalanx deformities was done for 4th and 5th toes in the same sitting and fixed with K wires (Fig3). The wires were removed at 4 weeks. Complete correction of deformities was achieved by 2 months and the fixator removed after 4 months of surgery.



Figure 3: Closing wedge osteotomy+ limb lengthening, Corrective osteotomy of the proximal phalanges & K Wiring

### Discussion:

Aplasia of the ACL may be associated with multiple morphological changes within the joint. List of the changes and the recommended management from literature are given in table. It is important that arthroscopy and ACL surgeons are aware of this entity and its presentations to effectively manage when confronted with such a clinical situation as many of these cases may not complain of instability into adulthood.

Findings	Management
Isolated ACLA	Conservative if asymptomatic, ACLR if symptomatic
ACLA+ Meniscal Tear	ACLR+ Meniscal Tear repair
ACLA + Narrow notch	ACLR + Notchplasty
ACLA + PCLA	Conservative/ Reconstruction
ACLA + LLD	ACLR (Extra articular) + Limb Lengthening/ Epiphyseodesis
ACLA+Severe Deformity	Decreased Tibial Slope
ACLA + deformity of tibial shaft	ACLR + Correction of tibial deformity



Figure 4: Final follow up images

It is important that arthroscopy surgeons are aware of this entity and its presentations to effectively manage when confronted with such a clinical situation as many of these cases may not complain of instability until adulthood.

### References:

1. Kambhampati S. Bucket handle horizontal cleavage tear of medial meniscus with congenital deformity- A case report. Journal of Arthroscopy and Joint Surgery. 2019;6(3):146-148.



# PRIMARY ACL REPAIR (FEMORAL SIDED TEAR – SUTURE ANCHOR REPAIR AND INTERNAL BRACING)

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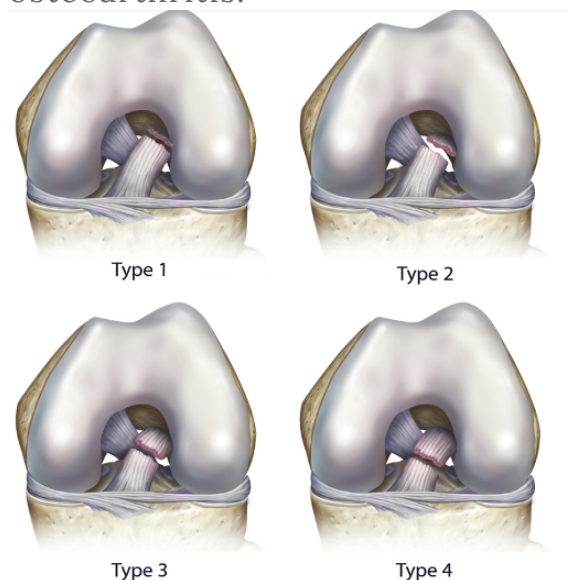
## Abstract:

A 30-year-old male patient presented with injured right knee 1 week prior to presentation. Patient Injured his knee while playing football. He was diagnosed with femoral sided tear (Shermans type 2) in the MRI. He was taken up for arthroscopic ACL repair with internal bracing. The technique, and review of literature is being discussed in this report.

## Introduction:

Recently, there has been a renewed interest in primary repair due to several factors. Firstly, recent research has shown that primary repair is most commonly performed in proximal tears due to better vascularity [1] and good healing potential [2] and

outcomes of primary repair are better in proximal tears compared to midsubstance tears in both historical [3] and modern-day studies [4]. Secondly, minimal invasive arthroscopy techniques are available nowadays with early rehabilitation that were both not available or commonly used during the open repair era [5]. Surgeons have been pursuing the concept of primary repair because of the (potential) advantages: the ligament is preserved with its proprioception, graft side morbidity can be prevented [6], revision surgery is similar to primary reconstruction which is not the case with reconstruction surgery [7], and it may potentially decrease the incidence of osteoarthritis.



Shermans Classification of  
ACL tear

Figure 1: Type 1 tears were true soft-tissue avulsions with minimal ligament tissue left on the femur. Type 2 tears had up to 20% of the tissue left on the femur. Type 3 tears had up to 33% of the ligament tissue left on the femur. Type 4 tears were true midsubstance tears with up to 50% of the ligament tissue left on the femur.

### Case:

A 30-year-old male patient presented with injured right knee 1 week prior to presentation. Patient Injured his knee while playing football. He immediately developed swelling and ice was applied as the first aid measure. He noticed giving away on brisk walking and with pivoting movement. He was able to walk normally, but was associated with pain. There were no locking symptoms/ click sounds from the knee. There was no other joint involvement.

On examination, Patient had moderate effusion with fullness in the suprapatellar pouch. His range of movement (ROM) was 0- 100, Lachman test and Anterior Drawer was positive. McMurray test was painful. Patient was further evaluated with MRI scan and revealed femoral side tear of ACL in mid-sagittal sections of the MRI. It was identified to be Sherman's type 1 tear. (Classification in figure 1 & 2).

The patient was taken up for surgery, and ACL tear was identified from the femoral attachment. This patient was the ideal case for primary ACL repair – Sherman type 1, young patient, acute injury and good ACL stump. 2 fiber wires were taken and with the help of knee scorpion, multiple bites were taken in the ACL stump from distal to proximal in both AM and PL bundle of ACL. Then the fiber wires were loaded onto the 4mm suture-less anchors and they were inserted into the foot print area. The AM bundle suture anchor was also loaded with fiber tape before its insertion. Then the fiber tape was draped anteriorly over the ACL stump and was shuttled out through the tunnel in the proximal tibia and taken out of the anterior cortex of tibia. (figure 3) Then the another 4mm knot-less anchor was used to fix the fiber tape in 30-40 degrees of flexion of the knee. Arthroscopically knee was taken into knee range of movement and tightness was checked.



Postoperatively knee was immobilized for 3 weeks then the passive knee ROM was started. Progressed to full weighing walking and full ROM by 6-8 weeks.

Figure 2: MRI scan showing femoral side tear of ACL in mid-sagittal sections.

- The advantage of ACL repair is potential to preserve the native insertion site and proprioceptive function, lead to more normal joint mechanics and decreased risk of post traumatic osteoarthritis [8].

- Rationale to use fiber tape:  
Was the 2 mm high strength tape provides stability and could act as a scaffold, together with the looped sutures they help to keep the clot between the ruptured ends.

Combined with microfracture provides an environment in which the ACL can heal around the fibre tape.

Further it reinforces the ligament as a secondary stabilizer.

Recently, Van Heusden et al. [9] reported excellent outcomes of primary repair with additional internal bracing in 42 patients with 4.8% failures at 2-year follow-up. Heitmann et al. [10] tested different types of suture augmentation and showed higher load-to-failure of augmented ACL repairs (464–624 N) compared with ACL repairs without augmentation (177 N) and with ACL reconstructions with hamstring tendons (362 N). Seitz et al. showed significantly higher stiffness, tensile strength, and less anteroposterior laxity of augmented ACLs.

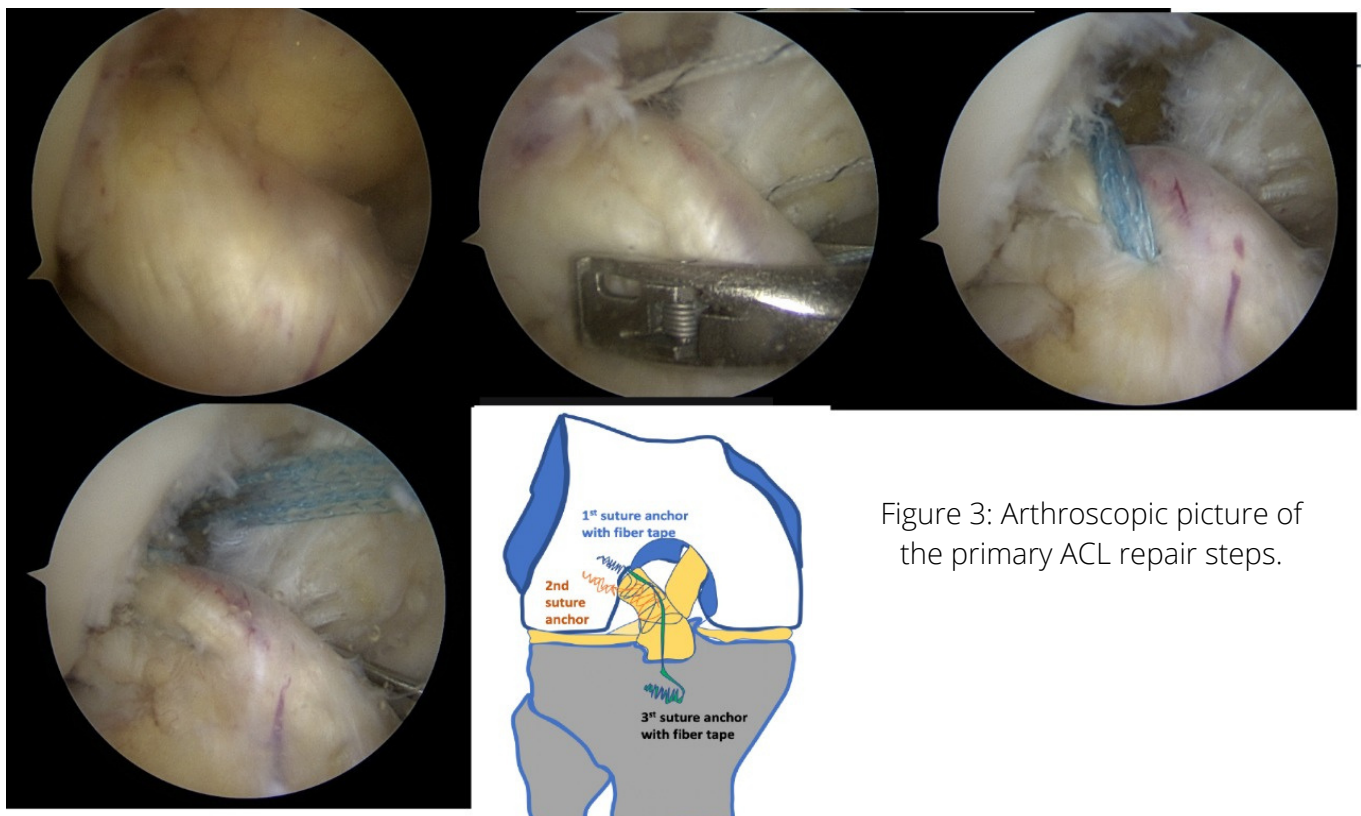


Figure 3: Arthroscopic picture of the primary ACL repair steps.

Implementation of an internal brace is safe and no failures were related to the hardware, were reported. Most of the surgeons now selectively perform additional internal bracing in patients at high-risk for failure, including those of young age, with generalized hyperlaxity, younger female patients or those competing in high-level pivoting sports. It could be argued that internal bracing should be included on all repairs in light of the minimal complications that have been encountered, while not factoring in costs. When comparing outcomes of ACL repair with ACL reconstruction in the literature, the failure rates of ACL repair in most of the studies are similar to slightly higher than ACL reconstruction outcomes. However, ACL reconstruction can be associated with significant postoperative quadriceps muscle weakness and knee stiffness, which require a strenuous and time-consuming rehabilitation program. There are preclinical data that suggests that ACL repair results in a lower risk of osteoarthritis than both reconstruction and conservative treatment.

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## Conclusion

- Primary ACL repair should be reserved and proper patient selection is necessary and should be cautiously adopted.
- Young patients and acute injuries are the ideal indications for the repair.
- Proximal injuries (Sherman type 1 and 2) tears are good candidates for repair.
- Good quality of remnant ACL tissue (no fraying) is needed for good outcome.