

Role of Judet Quadricepsplasty in the Management of Extension Contracture of Knee

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ABSTRACT

Introduction: Extension contracture of the knee is a well-known complication of supracondylar femoral fractures. Quadricepsplasty is a technique devised to release extra-articular adhesions or contractures which prevent flexion of knee. Judet quadricepsplasty is a proximally based quadriceps muscle slide that addresses all elements of knee contracture. The main objective of this study to study role of judet quadricepsplasty in the management of extension contracture of knee.

Materials and Methods: Five patients with extension contracture of underwent judet quadricepsplasty. In judet quadricepsplasty, each of the contributing factors is addressed in staged procedure, with a passive manipulation after each stage to assess the flexion achieved. Follow up done at 3 weeks, 6 weeks, 3 months and 6 months and range of movement noted.

Results: At 6 month followup, Case 1 had 110° of flexion with no extension lag, case 2 had 100° of flexion with no extension lag, case 3 had 110° of flexion with 10° of extension lag and case 4 had 95° degree of flexion with 10° of extension lag.

Case 5 developed deep infection 2 weeks postoperatively. He was treated with debridement and i.v antibiotic for 6 weeks.

Conclusion: The advantage of the judet technique is that it permits a controlled, sequential release of the intrinsic and then the extrinsic components limiting knee flexion.

Keyword: Judet Quadricepsplasty, Extension Contracture Of Knee, Supracondylar Femoral Fracture.


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INTRODUCTION

Extension contracture of the knee is a well-known complication of femoral fractures, especially in the supracondylar region. Extension contracture of knee is much less common than flexion contracture.

Quadricepsplasty is a technique devised to release extra-articular adhesions or contractures which prevent flexion of knee. The cause of the most adhesions or contractures is an injury leading to the fibrosis or scarring of the whole or part of the quadriceps. The adhesion may be between vastus intermedius and femur or between patella and femoral condyle or there may be contracture of lateral and medial retinacula or rest of rectus femoris as described by Nicoll (1963).¹

Judet quadricepsplasty² is a proximally based quadriceps muscle slide that addresses all elements of knee contracture. Paley³ has modified the incision from the original Judet technique. The main objective of this study to study role of judet quadricepsplasty in the management of extension contracture of knee.

MATERIALS AND METHODS

This prospective study done in Patna Medical College and Hospital. Five patients with extension contracture of knee underwent judet quadricepsplasty. In judet quadricepsplasty, each of the contributing factors is addressed in staged procedure, with a passive manipulation after each stage to assess the flexion achieved.

Phase 1 involves a release of the medial and lateral retinacula, together with a release of adhesions in the suprapatellar gutter and between the patella and the femoral condyles. This is performed through a longitudinal lateral and/or medial parapatellar incision. When flexion is still limited after passive manipulation, the vastus intermedius is released in phase 2. This requires a long lateral incision extending from just lateral to the superior pole of the patella to the level of greater trochanter. The vastus lateralis is divided from the linea aspera. The vastus intermedius is then identified and lifted extraperiosteally off the lateral and anterior

surfaces of the femur. If fibrosis is present, the fibrotic part of vastus intermedius are resected. If flexion is still limited phase 3 is performed. This requires extension of the incision proximally and anterolaterally over the hip, so that the origin of the rectus femoris

can be detached from anterior inferior iliac spine. Postoperatively, the hip and knee are flexed to 90° for 24 hours and CPM is started. Follow up done at 3 weeks, 6 weeks, 3 months and 6 months and range of movement noted.

Table1: Shows range of movement gained after Judet procedure

S.no	Age/sex	Cause	Preop ROM	Judet phase	Post-op ROM	Gain
Case 1	40y/M	SC#	5-25°	1,2	5-115°	90°
Case 2	35y/M	#patella	0-20°	1,2,3	0-100°	80°
Case 3	38y/F	SC#	10-20°	1,2,3	10-100°	80°
Case 4	40y/M	SC#	10-30°	1,2,3	10-90°	60°
Case 5	26y/M	#patella	0-25°	1,2	0-90°	65°



Fig 1: Phase 1 of Judet Procedure



Fig 2: Phase 2 of Judet procedure



Fig 3: Phase 3 of Judet procedure

RESULTS

Details of our patient group are shown in table 1. An intensive rehabilitation programme was maintained for six months. At 6 month followup, Case 1 had 110° of flexion with no extension lag, case 2 had 100° of flexion with no extension lag, case 3 had 110° of flexion with 10° of extension lag and case 4 had 95° degree of flexion with 10° of extension lag.

Case 5 developed deep infection 2 weeks postoperatively. He was treated with debridement and i.v antibiotic for 6 weeks. At 6 month follow-up he still had reduced range of active motion but he had full passive extension.

DISCUSSION

Nicoll¹ identified four ways in which normal distal excursion of the patella may be blocked in flexion:

- (1) Extrinsic fibrosis of the vastus intermedius tying down the deep surface of the rectus femoris tendon to the front of the femur and suprapatellar pouch;
- (2) Intrinsic adhesions from the deep surface of the patella to the femoral condyles and adhesions of the tibia to femoral joint surfaces;
- (3) Extrinsic fibrosis and shortening of the lateral expansions of the vasti and their adherence to the lateral aspect of the femoral condyles with obliteration of the smooth, gliding mechanism of the paracondylar gutters; and
- (4) Extrinsic actual shortening of the rectus femoris. The treatment of knee extension contracture varies from an intensive programme of physical therapy, manipulation under anaesthesia, simple arthroscopy to lyse adhesions, to more extensive quadricepsplasty.³

The most frequently performed technique of quadricepsplasty was first described by Thompson.⁴

In 1959, Judet proposed an alternative technique of quadricepsplasty.² The results of 53 quadricepsplasties performed by Judet showed that 11% had extension lag, and the majority achieved active flexion beyond 100°.

Daoud et al.⁵ reported the results of six patients whose average final range of motion was 0° to 115°. A report of a bilateral case of Judet quadricepsplasty by Warner⁶ noted active range of motion from 0° to 120° bilaterally, 25 months post-surgery.

Merchan and Myong⁷ reported the results of twenty-one quadricepsplasties. Extension lag was less than 10° in six cases and greater than 10° in five patients. There was normal extension in the remaining patients. In twelve cases, greater than 90° of

flexion was achieved while in nine patients less than 90° was obtained. Bellemans et al.⁸ performed sixteen quadricepsplasties and at final follow-up, eleven patients (68.7%) had flexion of 90° or greater. In four cases, there was a 15° loss of terminal active extension. In our series, there was no extension lag in any of cases.

CONCLUSION

The advantage of the Judet technique is that it permits a controlled, sequential release of the intrinsic and then the extrinsic components limiting knee flexion. The technique is versatile and can be tailored according to individual.

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