REVISION ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION FOLLOWING SYNTHETIC LIGAMENT FAILURE USING HAMSTRING TENDONS

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Background

• Increasing number of primary ACL reconstructions leads to increase of revision replacements

• The incidence of graft failure following primary ACL replacements is 0.7 – 8 %

• Restoration of the normal knee kinematics is a challenge after failed ACL ligament replacement

• Results of revision ACL reconstruction are not as favorable as primary ACL replacements

• With every surgical procedure the anatomical and technical conditions become worse
General Problems at Revision ACL Replacement

- Poor placement of the graft leading to impingement
- Anteriorly placed femoral tunnel
- Inappropriate graft length with loss of motion
- Tunnel enlargement needing bone grafting
- Intraosseous metal fixation devices removal +/- bone grafting
- Staged procedures
Introduction

- At Mayday University Hospital London
  - 1992 to 2000
  - 29 procedures

- Isolated ACL Revisions were carried out following failed previous ABC prosthetic ligament reconstruction
Database

Total No of ACL Revisions 29

Replacement with

- Prosthetic ABC ligament 5
- Autograft 24
- Quadriceps Tendon Graft 2
- Patellar Bone Tendon Bone Graft 1
- Four Strand Hamstring Graft 21
Orthopaedic Principles of Mayday ACL Revision Replacement Technique

- Double Incision Arthroscopically Guided Operation
- Permanent Strong 4 Strand STG BH Polyester Soffix Complex
- "Straight through" Low Stress Placement
- Impingement Free Tibial Tunnel with Mayday Jig
- Grooved "Over the Top" Femoral Siting
- Tibial Tunnel Edge Chamfering
- Firm Monocortical Bollard Fixation
Materials & Methods

Algorithm for ACL Revision replacement

• Return of Subjective Instability – Giving Way
• KT 2000 Assessment & Physical Examination
• Arthroscopy – Tightening / Removal
• Physiotherapy
• Autologous ACL Revision Replacement
Failed ABC Ligament
Revision ACL STG Replacement

Removal of failed ABC Ligament
ACL STG Replacement
Hamstring Harvesting

- Surgical Approach
- STG Preparation / Stripping
ACL STG Replacement

Hamstring Harvesting
ACL STG Replacement

Harvested STG Tendons with Mayday BH Soffix
Mayday BH Polyester Soffix

Mayday BH Soffix on Frame
STG / Soffix Complex
Tendon Braiding & Fixation with Ethibond Sutures
4 Strand STG Mayday BH Soffix Complex
Tibial Tunnel Placement with Mayday Jig

- Mayday Jig

- Jig Placement into the Intercondylar Notch
• Mayday Jig in use

• X ray
Check the Guide Wire

- Position of Guide wire
- Arthroscopic view
Re-Drilling of the Tibial Tunnel

Cross sectional MR from Re-Drilled Tibial Tunnel
Tunnel Edge Radius ing & Chamfering

- Back Radius Cutter
- Position on AP & Lateral X-ray
Preconditioning of the Graft-Soffix Complex

- With 2-300 N Maximum Manual Pulling Force
Pulling the Graft into the Tibial Tunnel
Distal & Proximal Fixation at 15° Knee Flexion With 50 N Manual Pulling Force

- Proximal Femoral Bollard Fixation
- Distal Tibial Bollard Fixation
Graft in Straight Through final “Over the Top” Position

- Coronal & Lateral MR Scan from 4 Strand STG ACL Graft
Early Rehabilitation

- Brace Wearing in Full Extension for 2 weeks
- Early Full Weight Bearing
- Closed Chain Exercises for 3 month
- Jogging over 4 month
- Return to full activity, cutting & contact sports over 1 year
Results

- Male: 25
- Female: 4
- Average Age at Follow-up (Years): 36
- Range (Years): 25-51
- Mean Total Follow up Time: 34 Months (4-80)
Subjective Assessment

- Modified Lysholm Scoring System
- Tegner Activity Scoring System
- IKDC Patient’s Subjective scoring
Objective Assessment

- Lachmann’s Test
- Pivot Shift Test
- Instrumented Measurement (KT 2000 Arthrometer Side to Side Difference, SSD)
Results

Tegner Activity Scoring

- Pre-inj
- Pre-op
- Present

Different categories of Tegner scoring

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Results

IKDC Score

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Total mean KT-2000 Measurement
SSD 1.70 mm
+/- 1.64 SD
Pivot Shift

- Negative: 21
- Glide +/-: 7
- Frank: 1
- Total: 29
Conclusion

- Revision reconstruction of the anterior cruciate ligament can provide improvement in function and stability in the short to medium term.

- The outcome following revision surgery is not as satisfactory as that following primary procedure.

- We feel that highly accurate low stress, straight through placement of the tibial tunnel and over-the-top routing of the reconstruction avoiding the complications associated with re-drilling the femoral tunnel is the best routing for this type of surgery.
Conclusion

• Our technique has the advantage of being relatively easy to perform in what is otherwise difficult surgery.

• Use of a double looped hamstring tendon graft device can restore stability to the knee following failure of the primary reconstruction and even good results can be obtained in the short term in the multiply re-operated knee.
Thank you for your attention