QuadsTape System™
For Quadriceps Tendon Reconstruction

Surgical Technique Manual
The QuadsTape System comprises a wide open weave Poly-Tape prosthesis with associated instrumentation to repair a ruptured quadriceps tendon, without the need to harvest autogenous tissue.

We would like to thank Mr A. D. Toms, Consultant Orthopaedic Surgeon, Royal Devon and Exeter Hospital, Exeter, UK and Mr S. H. White, Consultant Orthopaedic Surgeon, Robert Jones and Agnes Hunt Orthopaedic Hospital, Shropshire, UK, for their work in developing this technique.
The Poly-Tape recommended for quadriceps tendon repairs is the 30 mm wide by 800 mm long prosthesis. It is an open weave polyester mesh, designed to act as a scaffold for soft tissue ingrowth and neoligament formation.

Advantages of the Poly-Tape prosthesis:
• it provides excellent intrinsic strength and allows early mobilization;
• the use of metalwork and wire cerclage is unnecessary and the associated high complication rate and problems of secondary removal are thus avoided;
• the prosthesis carries none of the risks or availability problems of allograft;
• there is no donor site morbidity as encountered with autograft;
• it is a simple, easy to learn technique with a low complication rate.

The following single use instrument is packed with the implant set:
• 20 cm malleable probe with eye for passing the Poly-Tape through the soft tissue.

The use of the Poly-Tape for quadriceps tendon reconstruction is particularly recommended for the following types of cases:
• where the diagnosis of rupture is delayed;
• ruptures where prolonged immobilization would be undesirable;
• patients who have a total knee arthroplasty in situ;
• cases where a previous patellectomy has been performed;
• complex patellar fractures (although no surgical technique is described in this manual).

Contraindications, warnings and precautions:
Please refer to the general Contraindications, Warnings and Precautions listed in the Poly-Tape Instructions for Use leaflet (Ref. LAB 028) packed with the implant.
PREPARATION AND INSPECTION
The patient is positioned supine. Broad spectrum antibiotic prophylaxis is administered intravenously. A side support and sandbag are useful to facilitate knee positioning. The leg is prepared and draped using aseptic technique.

RECOMMENDED APPROACH
A midline approach is recommended. Adequate exposure is essential and should provide sufficient access for the proximal and distal placement of the prosthesis. The ends of the tendon or ligament are identified as well as any additional pathology.

NOTE: It is necessary particularly in chronic cases to free up any adhesions involving the quadriceps mechanism. This will facilitate optimal post-operative rehabilitation.

The Poly-Tape is threaded through the eyelet of the probe (as provided in the system pack). The probe is used to pass the Poly-Tape transversely through the proximal end of the patellar tendon, just distal to the patella. In order to avoid abrasion of the prosthesis it should be passed through the mid substance of the patellar tendon.

Both ends are then taken proximally crossing anterior to the patella.

The probe is used to pass the Poly-Tape through the distal end of the quadriceps tendon.

The tension is carefully adjusted to remove any slackness from the Poly-Tape where it enters and exits the tissue.

Small tacking sutures are used to stabilize the Poly-Tape at soft tissue entry and exit points.

The ends of the ruptured tendon are approximated.

The probe is used to weave the Poly-Tape through the proximal end of the quadriceps tendon and musculature in a Bunnell fashion.
The tension is carefully adjusted to draw the quadriceps mechanism together and remove any slackness from the Poly-Tape where it enters and exits the tissue in the proximal tendon stump. The proximal ends of the Poly-Tape are knotted.

The range of motion and tissue tension is assessed. If this is satisfactory each surplus end of the Poly-Tape is cut with scissors at right angles to its length. This will minimize the generation of loose fibres. A short tail is left when cutting each end.

IMPORTANT:
- Any loose fibres created when trimming the Poly-Tape to length must be carefully removed from the incision site.
- After trimming to length it may be necessary to restrain the cut ends by stitching them back to the Poly-Tape.

A fibrous tissue envelope is recruited from surrounding tissue and closed over the prosthesis with small tacking sutures. This is vital to ensure the knot is covered with, and remains buried in, tissue. This also encourages fibrous ingrowth, reduces abrasion to the graft, and distances the prosthesis from the superficial wound.

WOUND CLOSURE
The wound is irrigated and a vacuum drain is put in place. Haemostasis is achieved. The dead space is closed with absorbable sutures before skin closure with a subcuticular, absorbable suture. The wound is covered with a dressing followed by a wool and crepe bandage.

TECHNIQUE FOR RECONSTRUCTION OF EXTENSOR MECHANISM RUPTURE POST PATELLECTOMY
The Poly-Tape is passed transversely through a 4.5 mm diameter tunnel at the level of the tibial tuberosity.

The Poly-Tape is crossed over the torn extensor mechanism. It is passed through the remnant of the quadriceps tendon and muscle. The free ends are brought out proximally and laterally, knotted and sutured to the surrounding extensor mechanism.

The patella retinaculum is repaired and the Poly-Tape is sutured to the fibrous tissue envelope.
POST-OPERATIVE MANAGEMENT

The rehabilitation programme (below) provides only an outline of the prescribed regime. For a full description refer to the document entitled “QuadisTape System Rehabilitation Programme for Quadriceps Tendon Reconstruction” (LAB 132).

The rehabilitation programme should be supervised by a specialist physiotherapist. All mobilization and exercises should be performed within the pain free range of movement.

As in any implant surgery satisfactory wound healing is of paramount importance.

The patient should be warned not to exceed the prescribed activity levels or to overload the repair before complete healing has occurred.

This Rehabilitation Programme was developed in conjunction with Ian Horsley MSc, MCSP, Clinical Lead Physiotherapist, English Institute of Sport (EIS) North West, of BackinAction Physiotherapy and Sports Injury Clinic, Wakefield, UK.

Week 0 to 1

- The patient may fully weight bear using crutches for stability (3 point gait moving towards reciprocal gait).

- A brace or splint is used to allow the patient to mobilize between physiotherapy sessions.

- The rehabilitation programme is commenced.

Week 1 to 3

- Rehabilitation is continued with increasing repetitions and pool work is commenced.

- Sutures are typically removed at this stage.

Week 3 to 6

- Rehabilitation is continued with increasing range of knee flexion.

- Balance exercises and static cycling are commenced.

Week 6 to 12

- The brace is discarded when full terminal knee extension control is achieved.

- Crutches are discarded when the patient has a reciprocal gait pattern.

- Rowing machine/stepper/cross trainer are commenced with low resistance.

Week 12 onwards

- Resistance to exercises is increased (avoid leg extension machine).

- On agreement with the physiotherapist, functional training and return to activity is allowed.

REFERENCE


For further references on this procedure please refer to the document "Neoligaments Scientific Articles" (LAB 144). This may be obtained from Neoligaments sales department, or downloaded from http://www.neoligaments.com/doclib/
102-1061  **QuadsTape System, includes:**
30 mm x 800 mm Poly-Tape (supplied sterile)

Packaged with the following disposables:
   Probe with eye - nickel silver 20 cm (supplied sterile)

202-3021  **Optional Instrument** (required for extensor mechanism repair following patellectomy):
Drill bit, plain shank to fit Jacobs Chuck, 4.5 mm diameter (supplied sterile)

Individual re-order Codes:
102-1083  30 mm x 800 mm Poly-Tape (supplied sterile)
202-3008  Probe with eye - nickel silver 20 cm (supplied sterile)

Please refer to the Instructions for Use leaflet packed with the Poly-Tape for essential information about Poly-Tapes, including Use, Sterility, Indications, Contraindications, Warnings and Precautions, Potential Adverse Effects and Storage. Additional copies may be obtained from Neoligaments sales department, or downloaded from http://www.neoligaments.com/doclib/