Long term follow up of neglected quadriceps palsy treated by hamstring transfer

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ABSTRACT

Various articles report on results of tendon transfers for disabling quadriceps paralysis following childhood Poliomyelitis. However, most such reports speak of such transfers done at an early age in life especially in the paediatric or pre-adult stage. At this age the brain is more ‘plastic’ and therefore more amenable to retraining after muscle transfer. As age advances, the capacity of the brain grey matter to re-orient itself diminishes.

Here we report on the gratifying results at two-years followup of a simultaneous semitendinosis and biceps transfer in a working middle aged lady.

Key words : quadriceps paralysis, polio, tendon transfer at older ages

INTRODUCTION

There are articles that report on the results of tendon transfers for disabling quadriceps paralysis following childhood Poliomyelitis. However, most reports speak of such transfers done at an early age, especially in the paediatric or pre-adult stage. At this age the brain is more ‘plastic’ and therefore more amenable to retraining after muscle transfer.

As age advances, the capacity of the brain grey matter to re-orient or adapt itself diminishes. Here we report on the gratifying results at two years followup following simultaneous semitendinosis and biceps transfer in a working middle aged lady.

CASE REPORT

A 38 year old clerk-cum-stenographer in a lower family court of a rural town presented with inability to walk independently except with assistance of bystander or a walking aid. Without these she could manage short distances with a hand-to-knee gait. She gave history of childhood poliomyelitis involving the left lower limb.

She was practically the sole breadwinner at home. On examination, her muscle power around the hip was grade 4-5. Her quadriceps was flail and the medial and lateral hamstrings were of grade 5 power. Static structures of hip and knee were stable. Ankle was in ten degree equinus, gastrosoleus, invertors and evertors were grade 4-5, ankle dorsiflexors were grade 3. Metatarsal drop and clawing accentuated with dorsiflexion of the ankle. (Figure 1)

There was 3 cm true shortening of the left lower limb. She had a hand on knee gait. The rest of her muscles elsewhere were strong. After explaining all the pros and cons diligently and deliberately on two separate occasions widely spaced apart to encourage any rethink or questions from their side, a single-stage simultaneous semitendinosus and biceps transfer was done.

Surgery, was done under epidural anaesthesia. Patient was positioned in a supine position, a tourniquet was used and a long posteromedial incision was made over lower third thigh extending to medial aspect tibial condyle.

Figure 1: Pre operative clinical photograph showing (L) knee with footdrop; the normal knee (R) is seen in full extension.
The semitendinosus was detached distally and with gentle finger dissection mobilised proximally to reach in line with proposed direction to patella.

Next, with a posterolateral incision over lower third thigh extending to fibular insertion, Biceps femoris insertion was detached, safeguarding common peroneal nerve and lateral collateral ligament and proximally dissected free to get a direct line to proposed insertion on patella. Next, with a midline incision exposing the lower quadriceps tendon and patella, an I-shaped incision was made through fascia, quadriceps tendon and periosteum over patella and tissues dissected away medially and laterally.

A vertical drill hole was made in midline on the patella using a 6 mm cannulated arthroscopic reamer, edges smoothened with rasp and both above tendons passed subcutaneously from earlier incisions to reach patella well anterior to knee axis. They were held with sufficient tension to permit unsupported 30 degrees of flexion with gravity and was sutured in this position to tissues above and below tunnels.

A few nylon 1-0 non-absorbable stitches between both tendons just proximal to patellar tunnel supplemented with no. 1 vicryl were added to ensure an anterior midline pull of the transfer. Subcutaneous sutures, followed by interrupted no. 1 nylon mattress closure done without tension.

Above knee slab with knee in extension given. However, she developed mild and superficial skin necrosis in her medial and lateral wounds which subsided with repeat dressings and antibiotics. Thus suture removal medially and laterally was sequenced and all the sutures were removed only by 5 weeks followed by supported knee mobilisation under strict physiotherapy guidance.(Figures 2 - 4)

Adjustable above knee brace given permitting only gradual increasing flexion to reach 60 degrees by 8 weeks and 90 degrees by 3 months. Weight bearing to tolerance was started at eight weeks on noticing good quadriceps with no effusion.(Figure 5)

However, as forewarned, the brace continued to be worn for a total period of one and half years before weaning off slowly. After this, we encouraged the patient to use a short knee brace while walking throughout life. Patient regained excellent function and stability of her knee.

An objective evaluation at 2 years follow-up shows strong active knee extension, absence of knee recurvatum and independent gait without need of any assistive aids whatsoever. (Figure 6) Knee extension power dramatically improved to grade 4 and she became independently ambulant 4 months following the surgery. The brace was maintained as planned for additional support. In fact, her morale improved to such an extent that she requested further surgery to correct an insignificant limp that was however improved with a raised footwear with rear straps to compensate for shortening and mild equinus.

**DISCUSSION**

There have been many reports of tendon transfers for Quadriceps palsy including use of biceps tendon alone, ITB, Adductor longus etc. But they all largely cover the results achieved in children or the younger population. We present here the case report of tendon transfer in a middle-aged lady.

Older individuals have less muscle power and muscles weakened by polio have been working extra-hard and extra-long. The anterior motor neurons affected during the initial acute phase of polio never function optimally and many have overfunctioned over years as well.

These are best exemplified by the post-polio syndrome where decades later, many recovered muscles start sliding back in function. Hence, we have assumed that in older individuals requiring tendon transfers, a delayed physiotherapy protocol from the norm is mandated, as exemplified in our case. This also is the rationale for encouraging the patient to use a short knee brace while walking throughout life besides a long consenting programme so they are aware of all things that can result in a sub optimal function.

The complications of superficial skin necrosis and delayed incision healing are educative in that in a 'poor muscle' compartment as in polio cases where vascularity is already low, multiple incisions and extensive subcutaneous tunneling needed cause further compromises in healing. A conscious attempt to reduce surgical trauma, delayed suture removal and mobilisation especially in older groups is mandated.

**CONCLUSION**

While it is true that tendon transfers are best done at an early stage in life for best results, this need not be a die-hard dictum as proved by this case. Though fresh cases of polio no longer occur in our country, there are undoubtedly many such cases of residual palsy in India / other developing countries. The case described shows good results are still possible even in the not-so-young population, therefore extending the indications for tendon transfer even to the delayed cases.
provided the patient and more importantly the family are well motivated and sensitised adequately to the issues at hand.

A good way to go about is for the Orthopaedic physician to acquaint himself well with the family surroundings, assess the motivation and understanding and insist on a long and repeated consenting process as the expectation of many of these patients are very high. The importance of a thorough and accurate clinical assessment cannot be overemphasised.

REFERENCES

3. Hamstring Tendon Transfer for Quadriceps Femoris Paralysis: Journal of Pediatric Orthopaedics


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Quiz - 1

Identify the clinical condition given below

For the correct answer turn to page 77