Original Paper

Minimally invasive technique for tendo-achillis lengthening (Dr Kothari's modification of White's technique)

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Abstract

White's technique is an established procedure for the lengthening of tendo-achillis in cerebral palsy and polio patients, as described in White's technique. We are presenting a series of 20 cases in whom we used two small incisions only at the proximal and disital ends of tendo-achillis. The procedure becomes minimally invasive with the total skin incision extending for only two inches, minimising skin complications. All cases reported with a very good healing within 15 days and the lengthening achieved was as desired. There were no complications of wound healing.

key words **: Tendo-achillis lengthening, spastic diplegia, cerebral palsy surgery, White's technique.**

Tendo-achillis (TA) is a strong plantar flexor of the foot, therefore important for walking and running purposes. Correction of equinus contracture by tendo-achillis lengthening is essential for the proper biomechanics of the entire lower limb, both in standing and walking. Various techniques are available for TA lengthening. Z-plasty may be done in sagittal plane or coronal plane according to biomechanical or functional needs. In White's technique the tendon slides on itself and gets adjusted according to the level of spasticity.

We modified the procedure by giving two smaller incisions so as to minimise skin complications.

The objective of our study is to analyse the modification in White's technique with two small incisions (Dr Kothari's modification).

The study was carried out in Department of Rehabilitation, Safdarjang Hospital and Vardhaman Mahavir Medical College, New Delhi. This is a retrospective study of twenty cases of TA lengthening done with the Kothari's modification of White's technique with a follow-up of 6 months. Of these twenty cases, 17 were cerebral palsy with spastic diplegia and 3 were infantile hemilpegia.

In Kothari's modification of White's technique, two small posteromedial longitudinal skin incisions are given approximately 2.5 cm each at insertion and at musculotendinous junction of the triceps surae. Distally, 2/3rds of the tendon is divided anteriorly and medial 2/3rds of the tendon is divided proximally. The foot is dorsiflexed forcibly when it snaps and correction is achieved as the tendon slides on itself. Incision is closed in layers. Below knee plaster of Paris cast is applied with foot in neutral position. Removal of sutures and AFO measurement is done after 14 days and POP cast is

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Account of contributions

The first Author is a qualified orthopaedic surgeon and a rehabilitation expert and was the chief surgeon for this series.

The Second Author is a qualified rehabilitation surgeon who was first assistant in the surgical procedure and was responsible for the follow up rehabilitation programme. He has also prepared the final manuscript for publication.

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Received on 01/04/2011, Accepted on 11/07/2011

reapplied for 4 weeks. AFO is fitted after 6 weeks of plaster cast immobilisation.

Two incisions are given for approaching tendo-achillis proximally and distally (Fig 1) .

The results were very encouraging in our series with good healing in all patients. No infection occurred in any of the 20 patients. Pain scoring during first 24 hours of surgery was 2.5/10 (as per numeric pain rating scale). There was minimal requirement of postoperative analgesics.

White's technique[1] is used for correction of TA contracture based on the observation that TA tendon rotates 900 on its long axis and an intracrural sliding can be achieved with appropriate fractional cuts. Graham *et al*[2] showed the efficacy of this procedure in long term follow-up. Khare *et al*[3] were following a similar procedure but they did not follow the principle of intracrural rotation of the tendon fibres and were using sutures to fix the lengthening contrary to our procedure in which we allow the spastic muscle to adjust the length as explained later. Cheng and So[4] have tried to establish a procedure for percutaneous lengthening but that is a blind procedure and there is no control on the tenotomy.

The TA lengthening in White's technique is done using a single incision from the level of insertion to the level of musculotendinous junction. Two-incision modifications help preserve a strip of skin in between the two incisions helping preserve skin circulation. Procedure is cosmetically better with early postoperative recovery. The spastic muscle adjusts the sliding after recovery from anaesthesia.

We will also like to recommend this technique for polio patients as the desired results can be achieved by two small incisions with caution that forcible sliding should not lead to overcorrection.

We already appreciate the importance of Tendoachillis lengthening procedure in spastic cerebral palsy. We highlight the benefits of using the White's techinique and modified the same with our minimally invasive approach which has shown excellent results.

Acknowledgement

The work of Dr Amod Kumar and Dr Renu Ambardar is acknowledged for the care of patients and helping in the record keeping of the patients.

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