Role and Outcome of Gastrocnemius Recession in Tibial Lengthening

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Introduction

Gastrocnemius tightness is frequently encountered in patients undergoing tibia lengthening. In some cases it needs gastrocnemius recession and in others, it does not. We designed a study to evaluate the following questions, 1. What are the risk factors that lead to need for gastrocnemius recession (GR)? 2. What are the indications for GR during tibia lengthening? 3. What is the outcome after GR?

Materials and Methods

We performed a retrospective case matched comparison of consecutive tibial lengthening patients who underwent GR (group A - 41 patients / 55 tibial lengthenings) with those who did not undergo GR (group B - 41 patients / 50 tibial lengthenings) from April 2000 to Feb 2012. The groups were similar for age, limb length discrepancy (LLD), preoperative tibial length, time in frame, and preoperative strength. Patients completed a self-reported outcome questionnaire on their ability to toe off on both feet, ability to toe off on one foot, ability to run, presence of limp, necessity for assistance to walk, weakness and stiffness of ankle relative to before tibia lengthening.

Results

Risk factors that led to need for GR were amount and percent lengthening. The amount of lengthening was 49 mm (range 15 - 82) and 35 mm (range 8 - 75) in groups A and B respectively. The percent lengthening was 15 (range 5-46) and 11 (range 2 - 29) in groups A and B respectively. Having had previous surgeries on the same limb increased likelihood of getting a GR (60% in group A and 36% in group B).Congenital etiology patients (58%) were more likely to need GR than post traumatic patients (39%).

GR was indicated and performed at four different time frames: at the time of frame application for patients with preoperative contracture (3deg) and for patients who developed recalcitrant equines contracture while in the frame (20deg), at the time of frame removal (15deg), and after frame removal (9deg). On average, the patients gained 23deg (range 0deg - 45deg) of ankle dorsiflexion (DF) after GR including all four groups. The change in the ankle DF after GR for each subgroup is listed in the table.

There were no significant differences in the self-reported outcomes between groups A and B. Self-reported outcomes were negatively affected by preoperative weakness, neuromuscular disorders, ankle joint or distal tibia surgery, and preexisting equines contracture.

Timing	Indication	Pre GR Equines Contracture (Degrees)	Final DF in Degrees (Average & range)	DF gained in Degrees (Average)
At frame application	Preop Contracture	2.5 (0 – 15)	3.5 (0 – 10)	6 (0 – 15)
While in frame	Recalcitrant Contracture	20 (10 – 30)	6 (0 – 15)	26 (15-35)
At frame removal	Recalcitrant Contracture	15 (0 – 30)	12 (0 – 50)	27 (10 – 45)
After frame removal	Recalcitrant Contracture	9 (0 – 20)	5 (0 – 15)	14 (10 – 20)

	Group A (GR)	Group B (Control)
Amount of lengthening (mm)	49 (15 – 82)	35 (8 – 75)
% of Lengthening	15 (5 – 46)	11 (2 – 29)
No of previous surgeries	12 Limbs	19 Limbs

Conclusions

Risk factors that led to need for GR were amount and percent of lengthening of 49 mm and 15% respectively, congenital etiology, and previous surgery.

Our indication for prophylactic GR varied with timing. At frame application, GR was done for prophylaxis in patients with small equines contracture. Recalcitrant equines of 20deg during lengthening and 15deg at frame removal were treated with GR. Persistent equines of 9deg was treated after frame removal. There was substantial gain in ankle DF achieved after GR.

With the regular use of GR in selected patients with equines contracture during tibial lengthening, satisfactory and uniform outcomes were achieved.