PLANTAR FASCIITIS IN THE ATHLETE

FROM PATHOMECHANICS TO SURGERY

Manuel Monteagudo

Orthopaedic Foot Ankle Surgery
Orthopaedic&Trauma Departmen
Hospital Universitario Quirónsalud Madrid
Fac Medicine UEM Madrid, Spain
mmontyr@yahoo.com
CONSERVATIVE TREATMENT:
Eccentric loading
PLANTAR FASCIITIS …

Plantar fasciotomy – irregular results
48 to 90% patient satisfaction

A BIT OF HISTORY ...

Arandes & Viladot – ACP system
BIOMECHANICAL ASPECTS OF GASTROC-ACHILLES-CALCANEAL-PFASCIA SYSTEM

Ankle plantar flexion – knee extension couple
BIOMECHANICS ACP

Gastrocnemius Recession as Treatment for Refractory Achilles Tendinopathy: A Case Report

Christopher E. Gencer, MD; Donald R. Bohay, MD; John G. Anderson, MD
Grand Rapids, MI

Gastrocnemius Recession to Treat Isolated Foot Pain

John D. Maskill, MD; Donald R. Bohay, MD; John G. Anderson, MD
Grand Rapids, MI

The Effect on Ankle Dorsiflexion of Gastrocnemius Recession

Stephen J. Pinney, M.D.; Sigvard T. Hansen Jr., M.D.; Bruce J. Sangeorzan, M.D.
Sacramento, CA and Seattle, WA
Novel biomechanics demonstrate gait dysfunction due to hamstring tightness
Kevin M. Cooney *, James O. Sanders, M. Cecilia Concha, Frank L. Buczek
Motion Analysis Laboratory, Shriners Hospitals for Children, 3645 West 8th Street, Elie P4, 1630, USA
Received 27 January 2004; accepted 17 August 2005

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ISOLATED GASTROCNEMIUS TIGHTNESS

By Christopher W. DiGiovanni, MD, Roderick Kuo, MD, Nirmal Tepwani, MD, Robert Price, MSME, Sigvard T. Hansen Jr, MD, Joseph Czerniecki, MD, and Bruce J. Sangeorzan, MD
Investigation performed at the Department of Orthopaedics, Harborview Medical Center, and the Seattle Veterans Affairs Medical Center, Seattle, Washington
Clinical Biomechanics 24 (2009) 744–750

Contents lists available at ScienceDirect
Clinical Biomechanics
journal homepage: www.elsevier.com/locate/clinbiomech

Gastrocnemius tightness on joint angle and work of lower extremity during gait
* Department of Physical Therapy, I-Shou University, Nan-Liao County, Taiwan
2 Department of Physical Therapy, National Taiwan University, Shilin, T'ai-Bin County, Taiwan
3 Department of Physical Medicine and Rehabilitation, Taichung General Hospital, Department of Health, Taiwan
4 Department of Orthopaedic Surgery, Taichung Veterans General Hospital, Taichung County, Taiwan
## Extensor Recruitment

<table>
<thead>
<tr>
<th>Swing Phase</th>
<th>40%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Rocker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Rocker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Rocker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Swing Phase**
  - Toe-off
  - Foot adjacent
  - Tibia vertical
  - Braking double support
  - Opposite toe-off
  - Opposite initial contact

- **Loading Response**
  - Single limb support

- **Pre-swing**

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Based on Perry & Whittle
GASTROCNEMIUS
Hicks
The Split Second Effect: The Mechanism of How Equinus Can Damage the Human Foot and Ankle

James Anis*

Department of Orthopaedic Surgery, University of Cincinnati, Cincinnati, OH, USA

FIGURE 2 | Motion analysis compared to same subject on treadmill shot at 250 FPS of subject with bilateral equinus and history right plantar fasciitis who is asymptomatic at time of testing. At 28–45%, frames C–D depict the timing of the split second effect. There is accentuated knee extension and a failure of ankle dorsiflexion. This lack of normal ankle dorsiflexion motion gives rise to leveraged forces upon the foot and ankle.
Nils Silfverskiöld (1888–1957)
EQUINISM
HOW TO EXAMINE?
<table>
<thead>
<tr>
<th>SURGICAL PROCEDURE</th>
<th>EPONYMOUS</th>
<th>ANATOMIC LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal GT</td>
<td>Silfverskiöld</td>
<td>5</td>
</tr>
<tr>
<td>Deep GSR</td>
<td>Baumann</td>
<td>4</td>
</tr>
<tr>
<td>Distal GT</td>
<td>Strayer</td>
<td>3</td>
</tr>
<tr>
<td>Superficial GSR</td>
<td>Vulpian, Baker</td>
<td>2</td>
</tr>
<tr>
<td>TAL</td>
<td>Hoke, White, Paley</td>
<td>1</td>
</tr>
</tbody>
</table>
Samuel and Pierre Barouk

Liberación de gastrocnemius
Resultados de una serie de 185 casos de APGM
THE DIFFERENTS TECHNIQUES OF GASTROCNEMIUS SURGICAL RELEASE

REUNION DE PRINTEMPS, SFMCP-AFCP, TOULOUSE, 8 JUIN 2006

P BAROUK, LS BAROUK, BORDEAUX
Section of the white fibers (Barouk)
PROXIMAL RELEASE BOTH GASTROCS?
Surgical Anatomy of the Proximal Release of the Gastrocnemius: A Cadaveric Study

Paul D. Hamilton, FRCS(Tr&Orth); Matthew Brown, MBBS; Neil Ferguson, MRCS; Miriam Adebibe, MBBS; Joanna Maggs, MBBS; Matthew Solan, FRCS(Tr&Orth)

Brighton, UK

Table 1: Medial and Lateral Sural Cutaneous Nerves in Relation to the Midline and Their Distance from the Tibial and Common Peroneal Origins, Respectively

<table>
<thead>
<tr>
<th></th>
<th>Medial cutaneous nerve</th>
<th>Lateral cutaneous nerve</th>
<th>Common peroneal nerve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance midline (average)</td>
<td>7 mm</td>
<td>23 mm</td>
<td>32 mm</td>
</tr>
<tr>
<td>Range</td>
<td>0–15 mm</td>
<td>10–42 mm</td>
<td>25–54 mm</td>
</tr>
<tr>
<td>Distance from origin</td>
<td>35 (18–60)</td>
<td>42 (2–70)</td>
<td></td>
</tr>
<tr>
<td>Author(s) (year)</td>
<td>Type of Study</td>
<td>No. of Subjects (procedures)</td>
<td>Mean age (range)</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------</td>
<td>------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Duthon et al. (2011)</td>
<td>Level IV (prospective case series)</td>
<td>14(17)</td>
<td>42 (20-64) yrs</td>
</tr>
<tr>
<td>Gentchos et al. (2008)</td>
<td>Level V (case report)</td>
<td>1(1)</td>
<td>46 yrs</td>
</tr>
<tr>
<td>Surdezzi et al. (2013)</td>
<td>Level IV (retrospective case series)</td>
<td>Noninsertional: 5(5)</td>
<td>48 (37-63) yrs</td>
</tr>
<tr>
<td>Kiewiet et al. (2013)</td>
<td>Level IV (retrospective case series)</td>
<td>8(8)</td>
<td>49.9 (-) yrs</td>
</tr>
<tr>
<td>Laborde et al. (2011)</td>
<td>Level IV (retrospective case series)</td>
<td>24(28); 18 available for follow-up</td>
<td>57 (47 to 74) yrs</td>
</tr>
</tbody>
</table>
Proximal Medial Gastrocnemius Release in the Treatment of Recalcitrant Plantar Fasciitis

Ali Abbassian, FRCS; Julie Kohls-Gatzoulis, FRCS; Matthew C. Solan, FRCS
Surrey and London, UK


ORIGINAL PAPER

Chronic plantar fasciitis: Plantar fasciotomy versus gastrocnemius recession

Manuel Monteagudo · Ernesto Maceira · Virginia Garcia-Virto · Rafael Canosa

Received: 3 July 2013 / Accepted: 4 July 2013 / Published online: 21 August 2013
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PROXIMAL MEDIAL GASTROCNEMIUS RELEASE
PROXIMAL MEDIAL GASTROCNEMIUS RELEASE
PROXIMAL MEDIAL GASTROCNEMIUS RELEASE
PROXIMAL MEDIAL GASTROCNEMIUS RELEASE
Analyze results of proximal medial gastrocnemius recession (PMGR) for the treatment of chronic recalcitrant plantar fasciitis

To compare isolated PMGR vs plantar fasciotomy in chronic plantar fasciitis
PATIENTS AND METHOD

Retrospective study

60 patients chronic recalcitrant plantar fasciitis
30 prox plantar fasciotomies vs 30 PMGR

Groups matched for:
previous treatments, time symptoms at surgery
(>9 months, average 13 months)
PATIENTS AND METHOD

11 preop and postop variables studied

BMI, sudden weight gain/loss, occupation, previous treatments, sport practice, Silfverskiöld test, return to work, to sport, calf power, patient satisfaction, complications.

VAS, AOFASh, Likert
WHERE TO LENGTHEN GASTROC?

PROXIMAL MEDIAL HEAD

Surgical Anatomy of the Proximal Release of the Gastrocnemius: A Cadaveric Study

Paul D. Hamilton, FRCS(Tr&Orth); Matthew Brown, MBBS; Neil Ferguson, MRCS; Miriam Adelibe, MBBS; Joanna Maggs, MBBS; Matthew Solan, FRCS(Tr&Orth)

FOOT & ANKLE INTERNATIONAL
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DOI: 10.1177/1121713709329220

LOCAL ANAESTHESIA, DAY PROCEDURE
POSTOPERATIVE PERIOD

Weightbearing as tolerated with use of crutches

Eccentric loading exercises from 3rd week

Progressive back to sport from 3rd week
POSTOPERATIVE PERIOD

Progressive back to sport:

from 3\textsuperscript{rd} week

from 5\textsuperscript{th} week
# RESULTS

<table>
<thead>
<tr>
<th></th>
<th>PARTIAL PROXIMAL FASCIOTOMY</th>
<th>PROXIMAL MEDIAL GASTRO RELEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORSENED POSTOPERATIVELY</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>COMFORTABLE FULL WEIGHTBEARING</td>
<td>4 WEEKS</td>
<td>2 DAYS</td>
</tr>
<tr>
<td>BETTER WITH RESPECT TO PREOP CONDITION</td>
<td>12 WEEKS (6-28)</td>
<td>5 WEEKS (1-16)</td>
</tr>
<tr>
<td>BACK TO WORK</td>
<td>3 MONTHS (1-6)</td>
<td>1 MONTH (0-3)</td>
</tr>
<tr>
<td>BACK TO SPORT</td>
<td>3 MONTHS (1-6)</td>
<td>1.5 MONTHS (0-4)</td>
</tr>
</tbody>
</table>
## RESULTS

<table>
<thead>
<tr>
<th></th>
<th>PARTIAL PROXIMAL FASCIOTOMY</th>
<th>PROXIMAL MEDIAL GASTRO RELEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOFASH PREOP</td>
<td>48</td>
<td>46</td>
</tr>
<tr>
<td>AOFASH POSTOP 1y</td>
<td>66</td>
<td>90</td>
</tr>
<tr>
<td>VAS PREOP (visual analogue scale)</td>
<td>8.1</td>
<td>8.2</td>
</tr>
<tr>
<td>VAS POSTOP 1y (visual analogue scale)</td>
<td>3.1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

VAS: Visual Analogue Scale
# RESULTS

<table>
<thead>
<tr>
<th>Patient Satisfaction</th>
<th>Partial Proximal Fasciotomy</th>
<th>Proximal Medial Gastro Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCELENT</td>
<td>10%</td>
<td>80%</td>
</tr>
<tr>
<td>GOOD</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>SATISFACTORY</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>POOR</td>
<td>40%</td>
<td>5%</td>
</tr>
<tr>
<td>RECOMMEND TO A FRIEND</td>
<td>45%</td>
<td>95%</td>
</tr>
</tbody>
</table>
## COMPLICATIONS

<table>
<thead>
<tr>
<th>COMPLICATIONS</th>
<th>PARTIAL PROXIMAL FASCIOTOMY</th>
<th>PROXIMAL MEDIAL GASTRO RELEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAINFUL SCAR</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>NEUROLOGICAL</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>WOUND DEHISCENCE</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>INFECTION</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>COMPLEX REGIONAL PAIN SYNDROME</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
RESULTS

PREOP DURATION OF SYMPTOMS DOES NOT CORRELATE WITH OUTCOMES

NO DIFFERENCE IN OUTCOMES REGARDING PREVIOUS TREATMENTS
RESULTS

NONE OF PATIENTS WERE WORSE

44 PATIENTS WERE PAIN FREE AT 6 MONTHS

ALL SCALES SHOWED IMPROVEMENT

95% PATIENTS WERE SATISFIED
RESULTS

HOW DO RESULTS COMPARE WITH PROXIMAL PARTIAL FASCIOTOMY?
DISCUSSION

WHAT IS OTHER GROUPS’ EXPERIENCE WITH GASTROJC RELEASE?
HIGHLY SATISFACTORY

Proximal Medial Gastrocnemius Release in the Treatment of Recalcitrant Plantar Fasciitis

Ali Abbassian, FRCS; Julie Kohls-Gatzoulis, FRCS; Matthew C. Solan, FRCS
Surrey and London, UK
DISCUSSION

LOSS OF CALF POWER?
NO, IT WORKS IN PRO ATHLETES
GASTROCNEMIUS SYNDROME
NO ERA CUENTO, NO

ASÍ HA QUEDADO EL PIE DE PAÚL TRAS LA LESIÓN
Un calvario que no da tregua a Bale

TEMPORADA 2013-2014
1 22-09-2013
Calentamiento (RMA-CET)
Sobrecarga muscular en el muslo izquierdo.
Partidos 2
Días 6

6 10-04-2015
RVM-RMA
Sobrecarga muscular en el pie derecho.

3 18-04-2015
RMA-MAL
Lesión en el sóleo de la pierna izquierda.

TEMPORADA 2015-2016
8 15-09-2015
RMA-SHA
Lesión en el gemelo izquierdo.

9 19-10-2015
Lesión en el músculo sóleo de su pierna izquierda.

10 17-01-2016
SPO-RMA
Lesión en el músculo sóleo de su pierna derecha.

 TemplARADA 2014-2015
5 20-10-2014
Rotura de grado II en el piramidal derecho (zona del glúteo).

TEMPORADA 2016-2017
11 23-11-2016
SPO-RMA
Lesión traumática de los tendones peroneos de su tobillo derecho.

12 23-04-2017
RMA-BAR
Lesión grado II en el sóleo de la pierna izquierda.

El galés se retira del campo tras la lesión sufrida ante el Barcelona.
SHORT GASTROCS SEEM TO PLAY AN IMPORTANT ROLE IN CHRONIC PLANTAR FASCIITIS

ISOLATED PROXIMAL-MEDIAL RECESSION IS SAFE AND EFFECTIVE
BETTER RESULTS THAN FASCIOTOMY

FIRST SURGICAL OPTION IN CHRONIC PLANTAR FASCIITIS, WITH FASCIOTOMY ONLY CONSIDERED IF FAILURE

THINK OF GASTROOC SYNDROME