FASCIAL MANIPULATION® FOR ANKLE SPRAIN
筋膜手法和踝扭伤

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1

EPIDEMIOLOGY
流行病学

- Between the 7% and 53% of patients with ankle sprain have consequences 7%到53%的踝扭伤患者都有后遗症
  Rogier M. et al 2008

- Symptoms症状:
  - Sensation of instability,感觉不稳
  - pain,疼痛
  - fatigue,疲劳
  - Difficulty in the normal performance of the inferior limbs.下肢正常活动困难

  Marcos de Noronha et al 2007

- The functional instability is an important consequence of the acute ankle sprain. It involve about the 40% of the patients功能性不稳是急性踝关节扭伤的一个重要影响。囊括40%的患者。
  Palmieri-Smith RM et al 2009

2

DIFFERENT DIAGNOSIS
不同的诊断

Instability不稳定性

Mechanical 15%-20% 力学性15%-20%	Functional 80%-85% 功能性 80%-85%
Surgery 手术	Rehabilitation 康复
recostruction重建 (tendon graf肌腱重建)	Embrication 肌腱修复
	Target目标？

The functional instability remains a symptom in many people who have suffered acute sprain and does not seem to be related to the mechanical instability. 功能不稳仍然是许多急性扭伤患者的症状，似乎与力学不稳无关

Bernier JN et al 1997

Instability and laxity of the foot can act as an autonomous framework or in combination 脚的不稳定性和松弛可以作为一个自主框架或组合

G. Pisani 2004

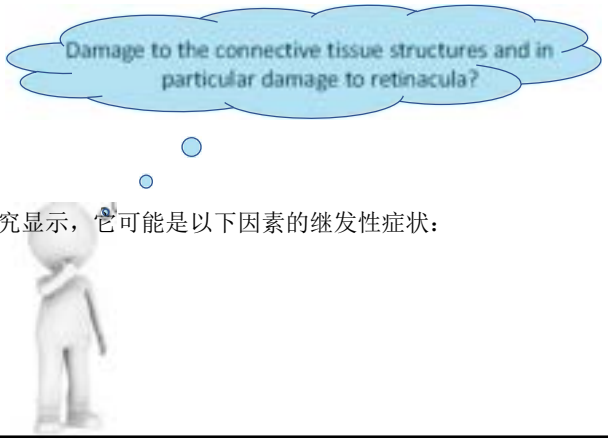
3

ETIOLOGY
病因学

Although the cause of instability functional remains unclear, recent studies have shown how it can be secondary to a number of factors such as:

- deficiency proprioception of the ankle
- loss of muscle strength
- increase in the reaction time muscle
- alteration of the control system balance

Santos MJ & Liu W.J 2008



尽管功能性不稳的原因还不清楚，但是最近的研究显示，它可能是以下因素的继发性症状：

- 踝关节本体感觉缺陷
- 肌肉力量缺失
- 肌肉反应时间增加
- 控制系统平衡病变

Santos MJ & Liu W.J 2008

4

IN RECENT YEARS A NUMBER OF PUBLICATIONS HAVE APPEARED ON THE RETINACULA INJURY近年来出现了许多关于支持带损伤的研究

Chronic injury of the peroneal retinaculum after ankle sprain踝关节扭伤后腓骨支持带慢性损伤

Cwinn & Marx 1987

Degenerative rupture of the peroneal retinaculum 腓骨支持带退行性撕裂

Zgonis et al. 2005

Thinning of the peroneal retinaculum in the aftermath of distortion 形变导致的腓骨支持带变薄

Kirby et al. 2005

The formation of myofascial fibrous tissue leads to the reduction of the ability of the muscle to stretch 肌筋膜纤维组织的形成导致肌肉伸展能力的下降

Fox et al. 2008

5

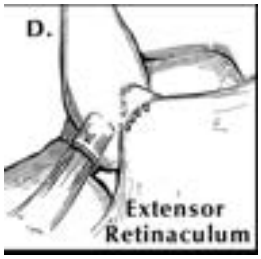
FACTORS FOR THE ERECTOR POSITION 直立姿势的影响因素

The anatomical features of the lower extensor retinaculum indicate that the excellent results obtained with the new surgical techniques were related more to a proprioceptive augmentation than to simple mechanical reinforcement下伸肌支持带的解剖特征表明，通过新的手术技术所取得的良好结果更多地与本体感觉的改善相关，而不仅仅是简单的力学强化。

M. Marconetto & E. Parino 2003

Reported excellent results in athletes and dancers treated with the Gould technique接受Gould技术治疗的运动员和舞者从中取得了很好的治疗效果

Hamilton et al 1993



Gould Technique

6

DIFFERENCES IN THE ANATOMY BOOKS
解剖书中的差异

Gosling
he does not distinguish between upper and lower retinaculum
他没有区分上下支持带

Rohen
The inferior retinaculum present a **Y** form
下支持带呈Y形

Pernkopf
The inferior retinaculum present a **X** form
下支持带呈X形

7

MATERIAL & METHOD
材料&方法

Anatomic - radiologist preliminar study
解剖学-放射科医师初步研究

- Dissection of 9 cadavers (5M; 4F mean age 64,8)
- Hystological and immunological study
- MRI of five healthy subjects (3F, 2M average age 26.5) to define the acquisition protocol and analyze the normal parameters of the retinaculum and their thickness, signal strength ...
- 9 具大体解剖 (5名男性; 4名女性 平均年龄 64,8)
- 组织学和免疫学研究
- 通过5名健康被试（3名女性 2名男性 平均年龄26.5）的磁共振成像，来取得数据分析支持带的常规参数以及其厚度、信号强度.....

Clinical study临床研究

- MRI of patients pre-treatment患者治疗前磁共振成像
- evaluation form评估表
- administered questionnaire问卷
- stabilometric exam稳定性检查
- Course of treatment of Fascial Manipulation筋膜手法治疗
- Follow up随访

8

MATERIAL & METHOD
材料&方法

Study using MRI of patients with outcomes (functional instability) of ankle sprain (> 3 months)研究使用有踝关节扭伤（功能性不稳）患者的磁共振成像（>3个月）

N° pazients患者数量	**25**
Sex性别	11M男; 14F女
Mean age (years)**平均年龄** (年) Standar deviation标准方差	22,04 ±6,4
Mean distance from the trauma (years)**距离创伤发生的平均时间（年）**	2,7

9

FASCIAL MANIPULATION®筋膜手法

What it is:什么是筋膜手法:

a technique of deep massage physiotherapy一种深层物理治疗按摩技术

What is the basis:基本要素有什么:

Separation between the points at which the subject reports as the site of pain and the treatment site患者主诉疼痛的点和治疗点是分开的

This is specifically the connective tissue针对于结缔组织:

- retinacular支持带
- myofascial肌筋膜

advantages优势:

Recovery in the short term可以在短期内恢复

Rebalancing global functional重新平衡整体功能

disadvantages劣势:

painful治疗时疼痛

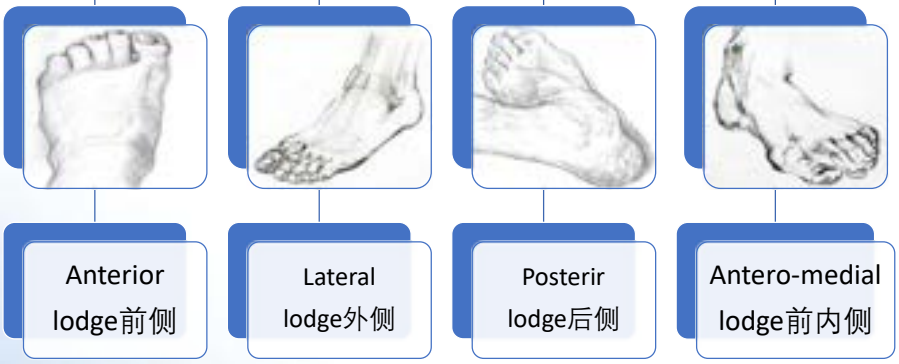
qualified Personnel对治疗师要求高

10

TREATMENT: FASCIAL MANIPULATION®
治疗：筋膜手法

Alteration of the ankle retinaculum踝关节支持带病变

Palpatory exam触诊检查



Anterior lodge前侧	Lateral lodge外侧	Posterir lodge后侧	Antero-medial lodge前内侧

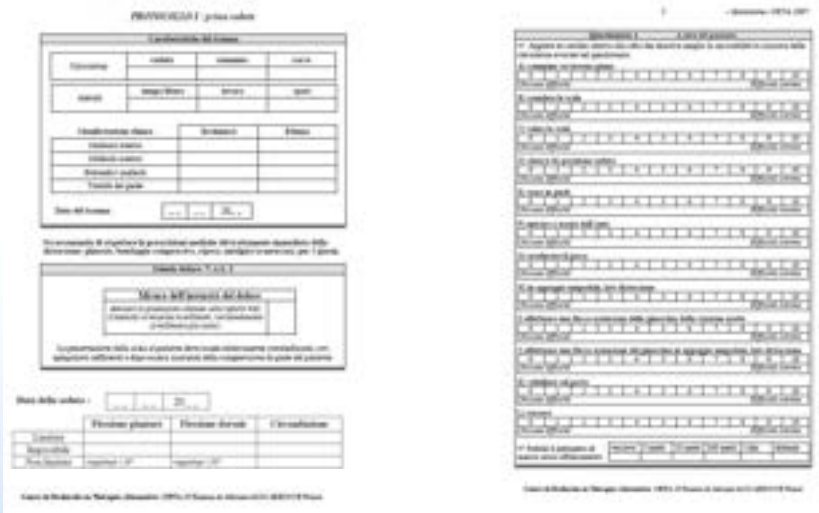
11

MODALITY OF TREATMENT治疗方式:

NUMBER OF TREATMENTS治疗次数	3
TIME LAG时间间隔	7 d天
DURATION OF TREATMENT治疗时长	45 min分
EVALUATION AT THE BEGINNING AND END OF CYCLE治疗周期开始和结束时的评估	Questionare Platform问卷

12

QUESTIONARE问卷



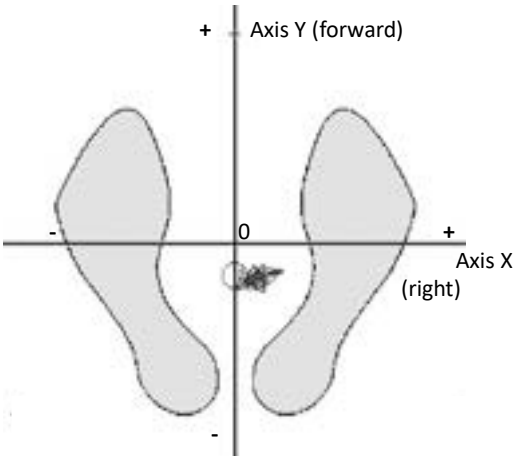
13

STABILOMETRIC PLATFORM
稳定性测量平台

It is a transductor of signal that calculates the instantaneous signal of the center of pression
它是一个信号传感器，统计压力中心的瞬时信号

- Strong significance (repeatability of measurements)
- contained intra-subject standard deviation
- marked sensitivity to events capable of causing alterations
- 显着性（测量的可重复性）
- 包含同一受试对象标准差
- 对能够引起病变的部分有敏感标志

Baratto L, et al 2002



14

PARAMETERS OF THE STABILOMETRIC PLATFORM
稳定性测量平台参数

SWAY PATH摇摆路径:

- length of the trajectory followed by the center of pressure compared to the duration of observation与观察时间相对的，压力中心所遵循的路径长度

SWAY AREA:要摆区域

- the surface swept by the radius that connects the points of the trajectory to the geometric center of the trajectory itself由半径扫过的表面，将轨迹的点与轨迹本身的几何中心连接起来

OAP:前后最大震荡

- maximum oscillation on the anteroposterior前后最大震荡

OEL:向外侧最大震荡

- maximum oscillation on the lateral side向外侧最大震荡

CONFIDENCE OF THE ELLIPSE椭圆置信度:

- axes of the ellipse that contains 95% of the points of the trajectory包含 95% 轨迹点的椭圆轴

15

ANATOMICAL STUDY RESULTS解剖研究结果

16

MACROSCOPICAL STUDY
宏观研究

In dissection, the retinaculum of the ankle appear a reinforcement of the crural fascia and pedidea.

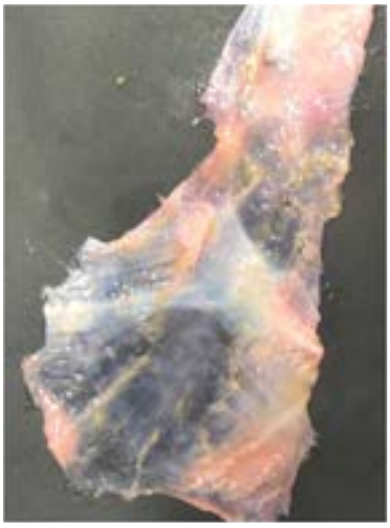
It is evident that their shape is not attributable to any description present in Literature.

在解剖中，踝部支持带出现了对小腿筋膜和足部的强化。

明显支持带的结构与文献中所描述的都不一样

17

FLEXOR RETINACULUM
屈肌支持带

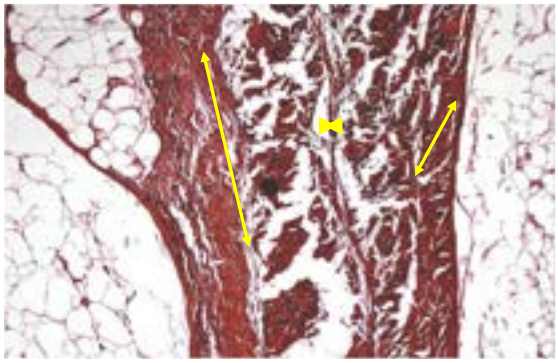


18

MUSCLE INSERTIONS -PERIOSTEAL INSERTIONS
肌肉止点—骨膜止点

19

HYSTOLOGICAL STUDY
组织学研究



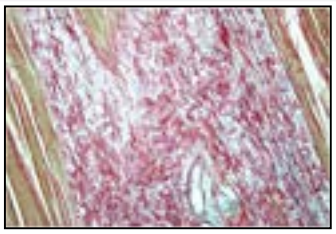
thickness of the inferior extension retinacula and crural fascia (µm)							
	1	2	3	4	5	6	
inferior extension retinacula	1342	1041	731	980	680	1280	1009 µm
crural fascia	817	737	513	431	405	830	591 µm

20

HYSTOLOGICAL STUDY
组织学研究

Van Gieson 染色 弹性纤维

van Gieson FOR ELASTIN FIBRES

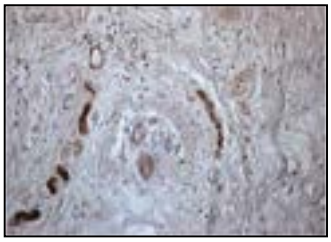


NO ADAPTATION AT THE STRETCING

牵拉时没有适应性改变

S100神经支配

S100 for the innervation



rich in free ending nerve

富含神经末梢

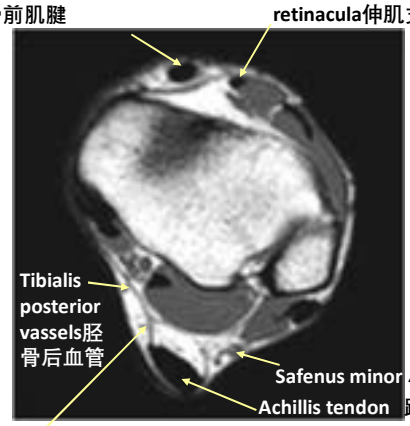
21

MRI ANKLE CONTROL
踝关节控制磁共振成像

Superficial layer exstensor retinacula 伸肌支持带浅层

Tibialis anterior tendon 胫骨前肌腱

deep layer exstensor retinacula伸肌支持带深层



Tibialis posterior vassels胫骨后血管

Safenus minor 小隐静脉

Achillis tendon 跟腱

Superficial layer of the flexor retinacula 屈肌支持带浅层

Superficial layer of the flexor retinacula屈肌支持带浅层

22

DISCUSSION讨论

The retinaculum are reinforcements of fascia支持带是筋膜的增厚

Many muscle fibers originate from their inner surface很多肌纤维的起点位于它们的内表面

they have many periosteal insertion它们在骨膜有很多止点

The retinaculum are well innerved支持带神经支配很丰富

Tractions produced:
- By muscle contraction
- The reciprocal movements of the tarsal bones

may explain the specific distribution of the fibrous bundles of the retinaculum

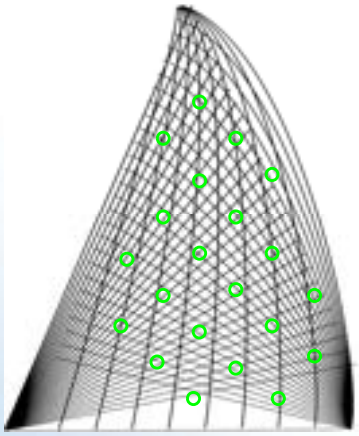
牵引产生：
- 由肌肉收缩带动
- 跗骨的往复运动是支持带纤维束的特定分布的原因

The retinacula may be:
- Involved in proprioception.
- Studied by MRI

支持带可能：
- 与本体感觉有联系
- 通过磁共振成像进行研究

23

DISCUSSION
讨论

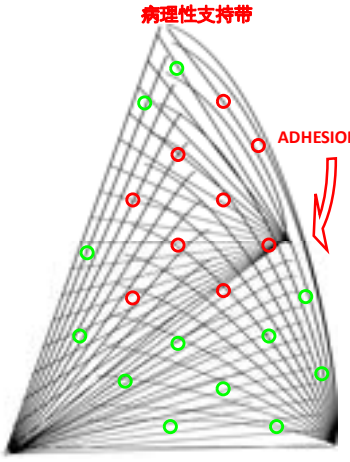


○ = mecanoreceptor normostimolat
力学感受器正常刺激

○ = mecanoreceptor hyperstimola
力学感受器过度刺激

ALGORECEPTOR算法接收器

PHATOLOGICAL RETINACULUM
病理性支持带



A trauma may cause deposition of neocollagen in the subcutis, resulting in adhesions that alter the distribution of the lines of force within the band. 外伤可能会导致新胶原在皮下组织沉积，导致粘连，进而改变肌束内力线的分布。

24

RESULTS: CLINICAL STUDY
结果：临床研究

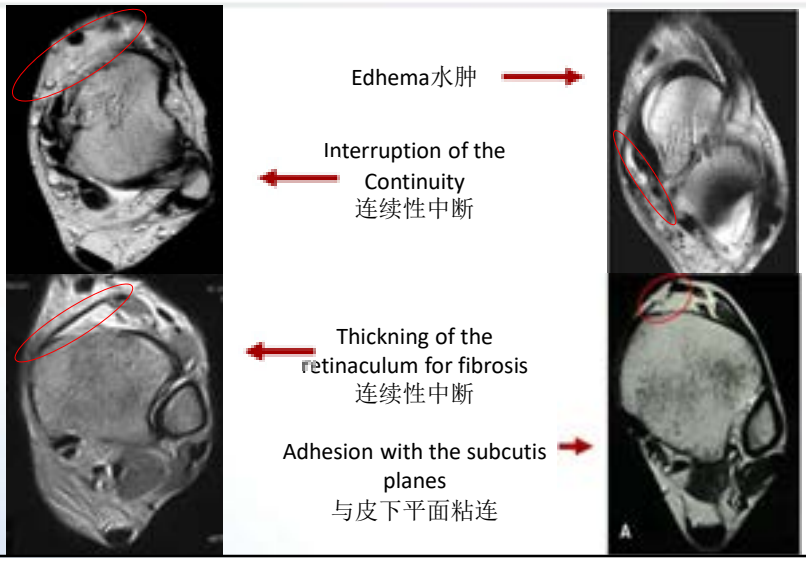
25

RESULTS: CLINICAL STUDY
结果：临床研究

Intervention 干预	• 50% emergency room • 30% protocol PRICE • 50%急诊室 • 30%PRICE处理原则
Modality 方式	• 50% fall摔倒 • 35% run奔跑
Manifestations 表现	• 25% ecchimosi (80% external malleolus) • 100% edema (95% external malleolus) • 25%瘀斑（80%外踝） • 100%水肿（95%外踝）

26

LESION OF THE RETINACULUM
支持带病变



27

MRI RESULTS PATIENTS
患者磁共振成像结果

总计 Total7	Ligament roptures韧带断裂						
N° subjects被试人数	1	2	3	4	5	6	7
Age年龄	24	26	21	28	29	24	24
Sex性别	F女	M男	F	F	F	M	F

总计Totale	Alteration o fthe retinaculum morphology支持带结构病变													
N° Subjects 被试人数	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age	23	22	27	26	20	36	21	13	24	19	27	21	13	20
Sex	M	M	F	F	M	F	M	F	M	F	M	M	F	M

总计Totale 4	无变化Negative			
N° Subjects 被试人数	1	2	3	4
Age年龄	21	24	20	20
Sex性别	F	F	F	M

28

RESULT ASSESMENT
结果评估

Limitation Range of motion
关节活动度受限

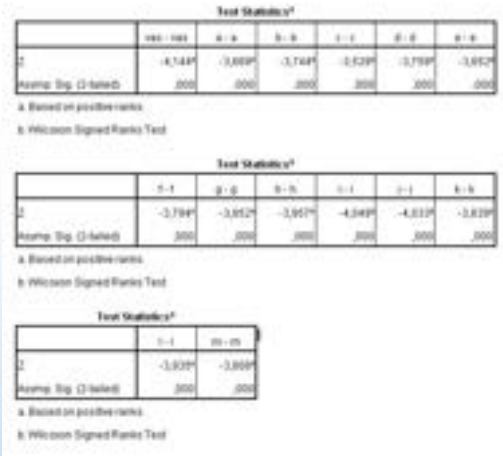
PRE treatment
治疗前
- 45% dorsiflexion背屈
- 35% supination旋后
- 35% abdution外展

POST treatment
治疗后
- 14% dorsiflexion背屈
- 9.5% supination旋后
- 0% abdution外展

FOLLOW UP
后续跟进

29

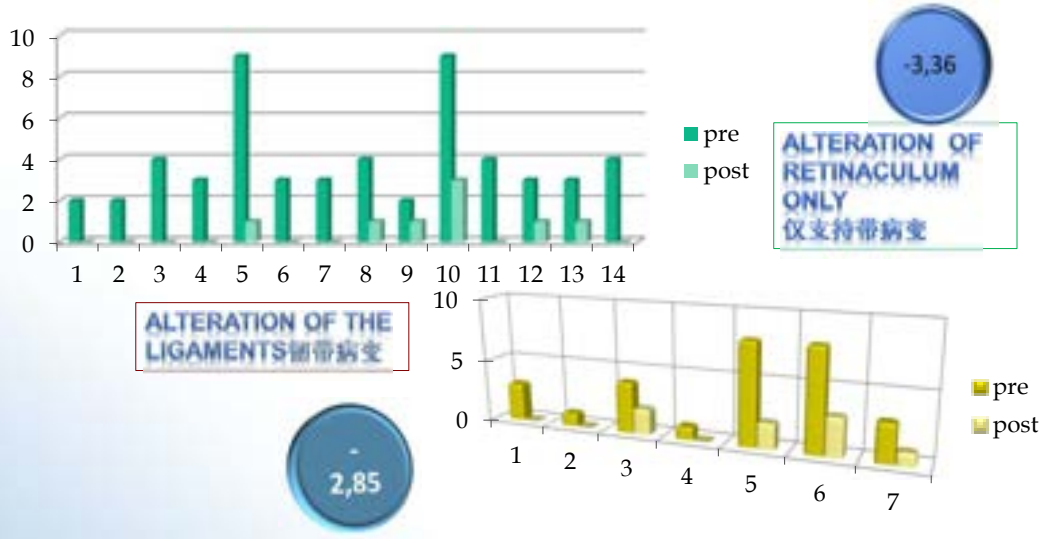
QUESTIONNIARE问卷



- At Wilcoxon Signed Ranks Test there was a statistical significance decrease (p <0.0001) of the follow different items:
  - questionnaire
  - VAS value
- 在Wilcoxon符号秩检验中，以下两个方面出现统计显著性数据下降(p <0.0001)：
  - 问卷
  - 疼痛评分

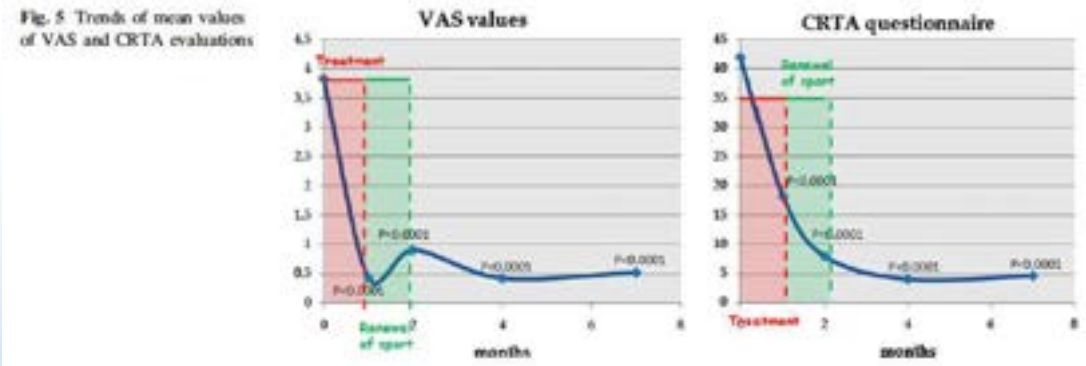
30

VALUTATION VAS PRE POST
治疗前后疼痛评分评估



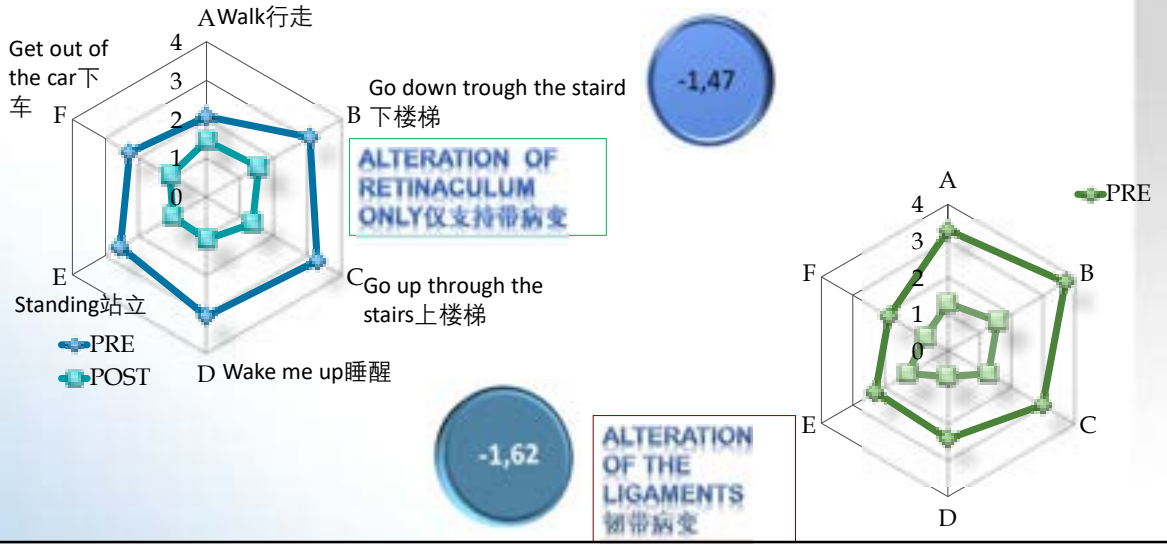
31

RESULTS VAS疼痛评分结果



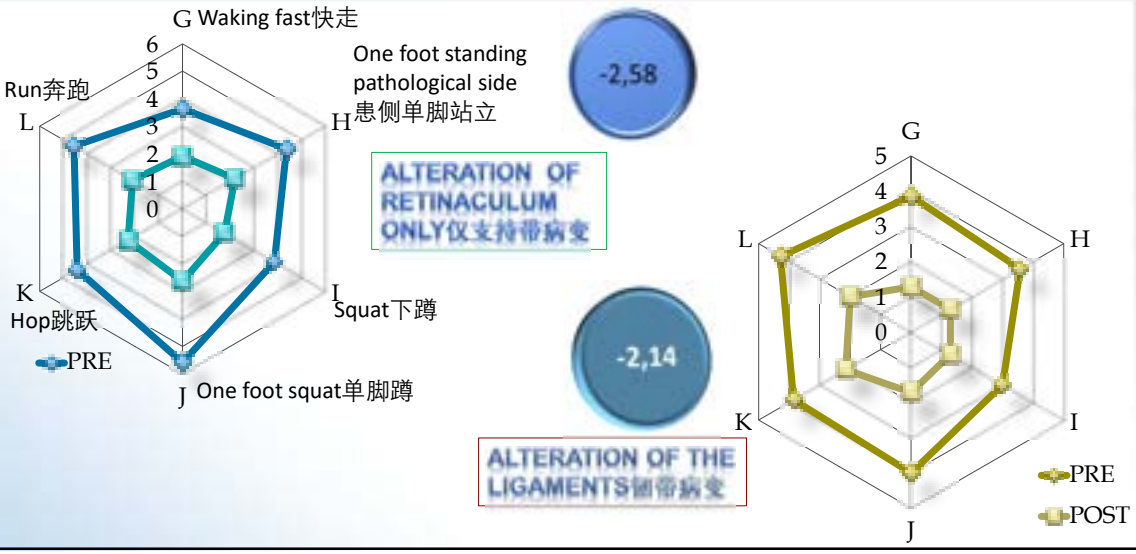
32

QUESTIONNAIRE: A.D.L.
问卷：A.D.L.



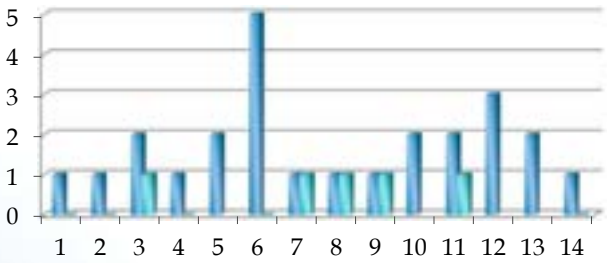
33

QUESTIONNAIRE: OVERLOAD ACTIVITY
问卷：超负荷活动



34

QUESTIONARE: WALKING TEST
问卷：行走测试

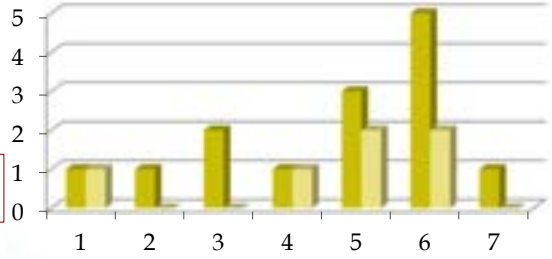


-1,28

ALTERATION OF RETINACULUM ONLY仅支持带病变

-1,14

ALTERATION OF THE LIGAMENTS韧带病变



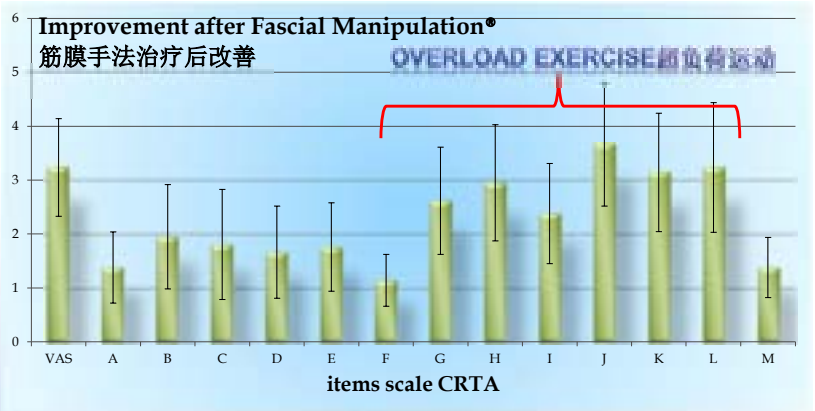
35

RESULTS:
结果

At the Wilcoxon Signed Ranks Test the difference between:
- Patients with ligament injuries
- Patients with lesions only retinacular

在Wilcoxon符号秩检验中:
- 有韧带损伤的患者
- 只有支持带损伤的患者

is not statistically significant
(p=0,273)
没有显著统计学差异
(p=0, 273)

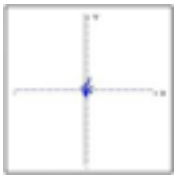


36

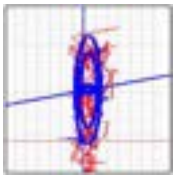
RESULTS STABILOMETRIC PLATFORM
稳定性测量平台结果

Statistical analysis of the difference in data pre post treatment cycle performed using Wilcoxon Signed Ranks Test showed a two-tailed statistical significance
(p <0.05) of the 21 patients in the 10 values (5 + 5 eyes closed eyes open):
使用Wilcoxon**符号秩**检验对治疗前和治疗后周期不同数据进行分析，21名患者10组数据（5+5闭眼和睁眼）显示出双尾统计学差异(p <0.05)：

- Sway Path [mm/sec]
- Sway Area [mm^2/sec]



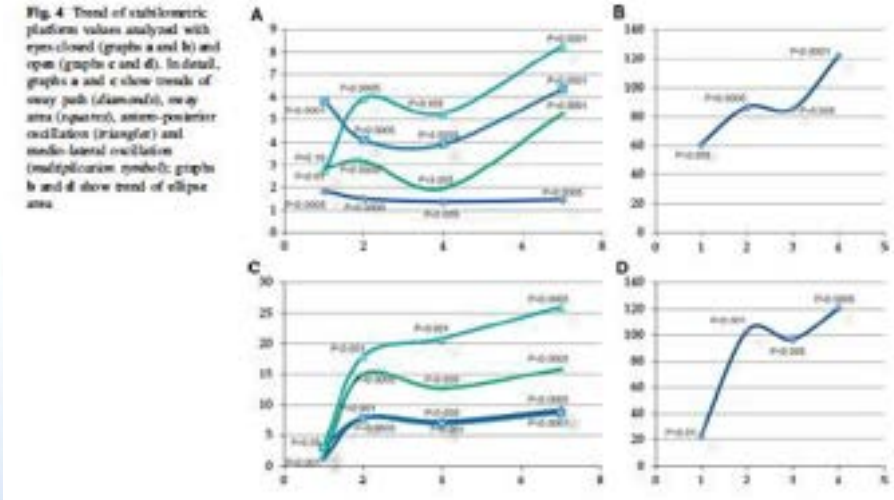
- Osc AntPost [mm]
- Osc LatLat [mm]



- Area Ellipse [mm^2]

37

RESULTS STABILOMETRIC PLATFORM
稳定性测量平台结果



38

CONCLUSIONS 1
结论 1

- It was found a marked improvement in the general symptoms reported by the patient after a Fascial Manipulation;
- The result is obtained in a short time;
  Follow-up shows a conservation of the results;
- The rebalancing of the fascia stress normalizes the proprioception;
- The stabilometric platform associated with a clinical evaluation precise allows a good classification of the patient and allows to objectify the results and comparison between techniques;
- The retinaculum may be damaged due to the distortion of the tibial tarsal joint;
- The retinaculum lesions are well evaluated by MRI, but also by a less expensive examination as ultrasound.
- 一次筋膜手法治疗后，患者表示整体症状有很大改善；
- 治疗后短期内取得效果；
  后续跟进显示治疗效果保持很好；
- 筋膜张力的重新平衡使本体感觉正常化；
- 可以进行精确临床评估的稳定性测量平台可以很好地对患者进行分类，使结果更加客观化，可以进行不同技术之间的对比；
- 支持带可能由于胫跗关节变形而收到破坏；
- 支持带破裂可以通过从共振成像进行评估，也可以通过平价一些的超声进行评估。

39

CONCLUSIONS 2
结论2

The retinaculum may be damaged in the distortion支持带可能在变形中受损

Proprioceptive DAMAGE: may cause subjective instability of the hindfoot and recurrent sprains本体感觉损伤：可能导致后足的主观不稳和反复扭伤

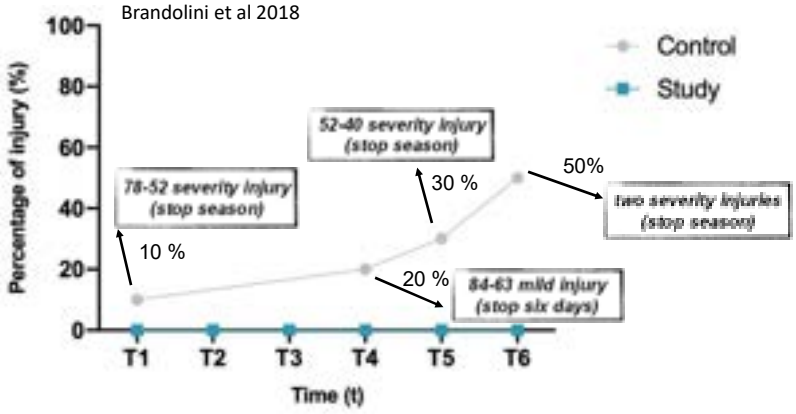
The WRAP FUNCTIONAL retrace the course of anatomical retinacula
贴扎的功能可以回溯到支持带的解剖

We believe therefore useful to adopt early this bandage to facilitate the deposition of neocollagen according to the lines of force, allowing the recovery of the correct stress state.因此，我们认为尽早使用贴扎技术可以有助于根据力线促进新的胶原蛋白的沉积，使张力回归到正常状态

40

ANKLE SPRAINS DURING THE SEASON
赛季中的踝扭伤

Brandolini et al 2018



Stubbe et al 2015

41

THANKS

42