Dr John Negrine
Foot and Ankle Surgeon
(To the poor and ignomious)

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Plantar plate repair
A “game changer”

John P. Negrine, F.R.A.C.S.
Foot and Ankle Surgeon
Sydney
Sexy specialties

• “Key-hole” surgery
• Laser surgery
• Microsurgery
• Minimal incision surgery
Foot surgery
Foot surgeon’s car vs knee surgeon’s car
Patient expectations

- Always works on RPA
- The wardrobe full of sexy shoes
- Cosmesis a big issue
- Foot surgery definitely not glamorous!!
Second MTP synovitis 1991
2\textsuperscript{nd} MTP instability

- Very common cause of forefoot pain
- Patients describe walking on a stone
- Swelling
- Deviation of the toe
- Sometimes paraesthesia
There is a general lack of recognition of this condition among GP’s, rheumatologists, podiatrists, physiotherapists and the general orthopaedic community.
Second MTP synovitis

- Spectrum from mild pain to marked deformity
- Mostly misdiagnosed initially as 2,3 neuroma
- Much more common in my practice
Plantar plate

- Thick structure
- Blends with capsule
- From metatarsal neck proximal to articular surface to base of proximal phalanx
- Blends with collateral ligaments medially and laterally
Plantar plate anatomy

- Rectangular or trapezoidal in shape
- Approx 19 x 11 mm
- 2 – 5 mm thick
- Originated from the plantar aponeurosis and flimsy attachment to the metatarsal neck
- Firm attachment to the base of the proximal phalanx
Patho-anatomy

- Once plantar plate ruptures interossei become extensors at MTP joint
- EDL will only extend PIP joint when proximal phalanx is flexed or in neutral
- EDL therefore a significant deforming force when MTP is hyper-extended

Fortin and Myerson 1995
Is this where hammer toes begin?
Isn’t that exciting???
Causes of 2nd MTP instability

- Long second metatarsal
- Hallux valgus
- Impact runners
- Arthritis
- Neuromuscular disease
- “Wear and tear”
What is the incidence of plantar plate tears in the normal population?

- 20 specimens
- 6 male average age 56.7
- 14 female average age 71.1
- 14/20 plantar plate tears 70%
- 3/6 males 50%
- 11/14 females 78.6%

(Intervertebral disc, rotator cuff, meniscus)

Lowell Weil Jr. August 2012
Diagnosis

• Clinical and usually obvious

• DD: Early arthropathy rheumatoid, Tumours such as PVNS, metatarsal stress fracture, neuroma
Life’s full of surprises!

The Daily V

Sunday, August 30, 2006

Spinster Rapes Burglar

An intruder got a surprise when recently he entered the house of 30 year old Millie Vincent. She was waiting for him behind the door to her bedroom and struck him with a lamp. The following 29 year old balaclava clad man recalls waking up nude and violated.

Dr John Negrine
Adult Foot & Ankle Surgery
65 year old GP

- Avid walker
- Presents with 2\textsuperscript{nd} MTP pain and swelling
- Initial x-rays normal June 2001
- Settled with taping/insole returned to walking
Re-presents 2003

- Pain and swelling 2\textsuperscript{nd} MTP joint
- Restriction of movement
- X-rays Freiberg's' infraction
- Adult cases rare but well described in the literature
45 year old lady

- 3 month history of 2nd MTP pain
- Clinically no instability
- MRI – Stress reaction proximal phalanx – normal plantar plate – normal metatarsal head
“Doctor do I need an M.I.R.?”

My iridologist said they were real good!!
Interpretation is the key
Girls’ schools still offering ‘something special’ – head

BY LAURA VICKERS
EDUCATION REPORTER

THE principal of Cheltenham Ladies’ College has described single-sex education as a “winning formula”, despite evidence showing the popularity of all-girls’ schools is declining.

The latest edition of the Good Schools Guide, out tomorrow, includes the lowest percentage of single-sex girls’ schools in its 25-year history.

Thirteen girls’ schools that appeared in the first edition of the guide have been forced to close or merge.

Cheltenham Ladies’ College was founded in 1853 and today educates about 1,100 girls aged 11 to 18. Principal Vicki Tuck said the school should be the pupils that emerge from it.

She said: “Our focus should be on the pupils that emerge from the school, not what the school claims to offer.”

Vicki Tuck said that was “something special” about the nurturing spirit of an all-girls’ school.

“Our staff focus on excellence for our students, first and foremost – the fact that we only educate girls is not what preoccupies us,” she said.

The fact that they do so well suggests that it’s a winning formula worth preserving.”

Janetis Wallis, a senior editor of the Good Schools Guide, said the all-girls schools that have remained are the “cream of the crop”.

“They really are stronger than girls’ schools were 20 years ago. We’ve got a lot of the dead wood has been swept away”

Outside of the classroom, he said, education was fundamental to students’ social development.

He added: “When can a single-sex school stage a variety show, school play, debate or concert with quite the same real-life sharing of experience and teamwork as a co-educational school can?”

And perhaps most crucial of all, how many all-girls schools can provide their pupils with the opportunity to read and manage boys.”

VICKI TUCK

Dr John Negrine
Adult Foot & Ankle Surgery
2\textsuperscript{nd} MTP JT capsulitis and lateral plantar plate tear
Table 2. Anatomic Grading of Plantar Plate Tears – Coughlin et. al 2011

Grade Patterns of Injury

0 Plantar plate or capsular attenuation, and/or discoloration

1 Transverse distal tear (adjacent to insertion into proximal phalanx [<50%]; medial/lateral/central area) and/or midsubstance tear (<50%)

2 Transverse distal tear (>50%); medial/lateral/central area and/or midsubstance tear (>50%)

3 Transverse and/or longitudinal extensive tear (may involve collateral ligaments)

4 Extensive tear with button hole (dislocation); combination transverse and longitudinal plate tear
2nd instability treatment

- ??50% can be treated non-surgically
- Tape the toe, toe splint
- Metatarsal dome
- ?Judicious cortisone injection
Non-operative treatment
When plantar plate ruptures pain often subsides but deformity increases
Once the toe no longer touches the ground the only way to bring it down is surgically
Bad operations

- Phalangeal or hemiphalangeal resection
- Isolated metatarsal head resection
- Second toe amputation (except in the very elderly)
Plantar plate repair

- 34 so far (began 21 November 2011)
- 30 female/4 male
- Age Range: 44 – 84
- Average age 61
- Second MTP 33/Third MTP 1
Associated procedures

- Scarf 22 patients
- First MTP fusion 2 patients
- Akin (phalangeal osteotomy) 1 patient
Plantar plate repair

• New instruments make it possible from “the top”
• Direct repair and advancement is performed
• Morbidity is less
Small pin distractor
McGlamry Elevator
Mini scorpion
Mini scorpion
Steps of the procedure

1. Pass McGlamry elevator to release plantar plate adhesions to metatarsal head
2. Weil Osteotomy provisionally fix 1.6mm k-wire
3. Place pin in base of proximal phalanx
4. Section collateral ligaments
5. Expose and debride plate tear
6. Put 0-fibrewire sutures in plate
7. Drill holes in base of proximal phalanx
8. Pass sutures
9. Tie sutures
10. Replace and fix Weil osteotomy
Technique
Technique
Plantar plate repair
Passing the suture
Final steps
Recovery

- 6 weeks in a recovery shoe
- Swelling 6 months
- So far 75% good results in 34 cases follow up < 12 months
Word of caution: The plantar plate is composed of type 1 collagen...we wouldn’t repair a meniscus in a 60 year old woman
Many people self-misdiagnose

You can learn to fly a ‘747 on the internet but it doesn’t make you a Qantas Pilot.

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