



# Artrorisi endo e esotarsiche nell'età di transizione e dell'adulto

**S.O.D CLINICA DI ORTOPEDIA DELL'ADULTO E PEDIATRICA**

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**S.O.S Ortopedia Pediatrica**

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(arthroereisis) AND (italy[Affiliation])



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+ del 15 %

## EXPORT AGROALIMENTARE ITALIANO PER PRINCIPALI PRODOTTI (IN MLN DI EURO E %)

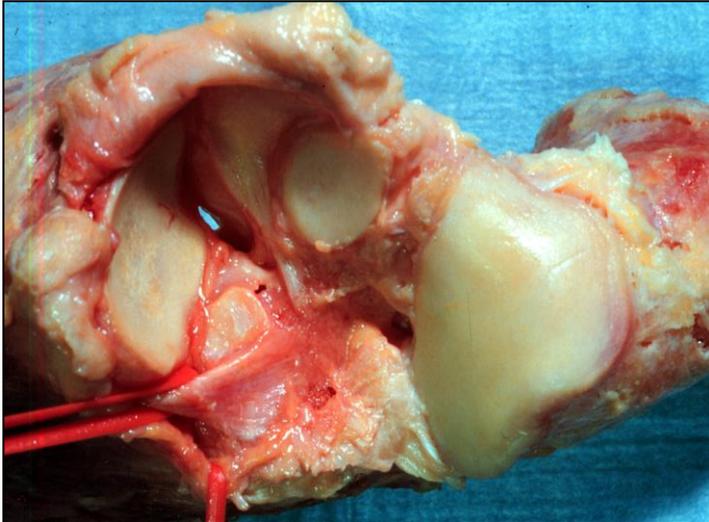
Prodotti	2018 (Milioni €)	2019 (Milioni €)	Variazione 2019 vs 2018 (%)
Vino	6.180,5	6.391,3	3,4%
di cui:			
- Spumanti	1.514,8	1.582,8	4,5%
- Fermi & Frizzanti confezionati fino a 2 litri	4.259,6	4.421,1	3,8%
Ortofrutta trasformata	3.590,9	3.670,3	2,2%
di cui			
- Conserve di pomodoro	1.579,2	1.666,7	5,5%
Frutta fresca	3.408,3	3.326,4	-2,4%
Formaggi e latticini	2.824,2	3.140,0	11,2%
di cui (non grattugiati):			
- Grana Padano e Parmigiano Reggiano	944,7	1.080,7	14,4%
- Pecorino	127,1	157,9	24,2%
Pasta	2.425,7	2.599,1	7,1%
Cioccolato e caramelle	2.037,4	2.160,7	6,1%
Salumi e carni trasformate	1.717,8	1.741,1	1,4%
Caffè e tè	1.502,3	1.594,4	6,1%
Ortaggi freschi	1.524,3	1.559,6	2,3%
Olio d'oliva	1.495,4	1.372,4	-8,2%



# Anatomia



1. Seno del tarso
2. Canale del tarso
3. Leg. Intrinseci ( cervicale, del canale del tarso)

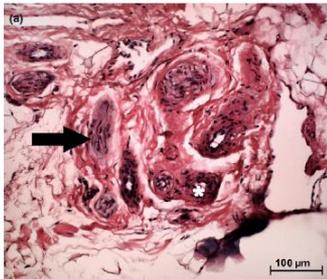


## Distribution of sensory nerve endings around the human sinus tarsi: a cadaver study

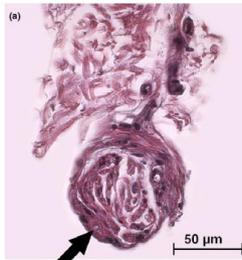
Susanne Rein,<sup>1</sup> Suzanne Manthey,<sup>1</sup> Hans Zwipp<sup>1</sup> and Andreas Witt<sup>2</sup>

<sup>1</sup>Center for Orthopaedic and Trauma Surgery, University Hospital 'Carl Gustav Carus', Dresden, Germany

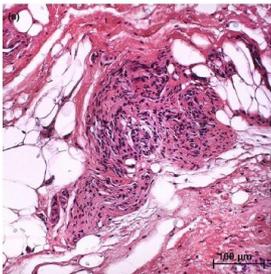
<sup>2</sup>Surgical Department, Hospital Fürstenland Toggenburg, Will, Switzerland



**Terminazioni nervose (+++)**



**Ruffini (+\/-)**



**Golgi (+\/-)**



## The role of arthroereisis of the subtalar joint for flatfoot in children and adults

Alessio Bernasconi<sup>1</sup>  
François Lintz<sup>2</sup>  
Francesco Sadile<sup>1</sup>

- 1. Artrorisi: ristabilire l'arco mediale, limitare il movimento della sotto-astragalica.**
- 2. Chambers 1946: «manipulation» tramite un «abduction block».**
- 3. Haraldsson 1962: introduce il termine «arthrohesis» , introducendo un cuneo nel seno del tarso.**

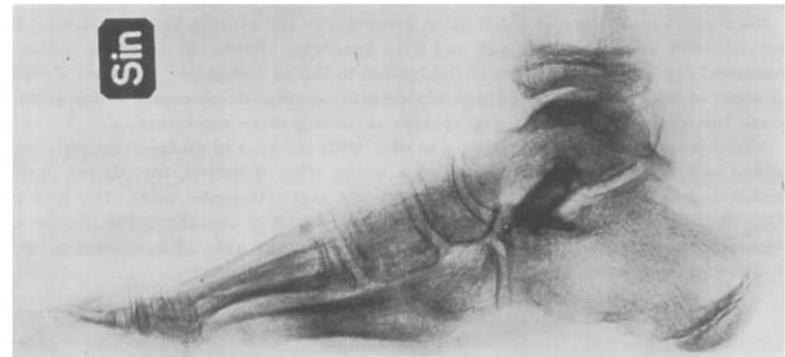
Acta orthop. Scandinav. XXXV, 234–256, 1965.

From the Orthopaedic Clinic Lund, Sweden.  
(Head Prof. Gunnar Wiberg)

### PES PLANO-VALGUS STATICUS JUVENILIS AND ITS OPERATIVE TREATMENT

By

STEFÁN HARALDSSON



*Fig. 1.*  
Position of bone grafts. (Foot No. 54).

The role of arthroereisis of the subtalar joint for flatfoot in children and adults

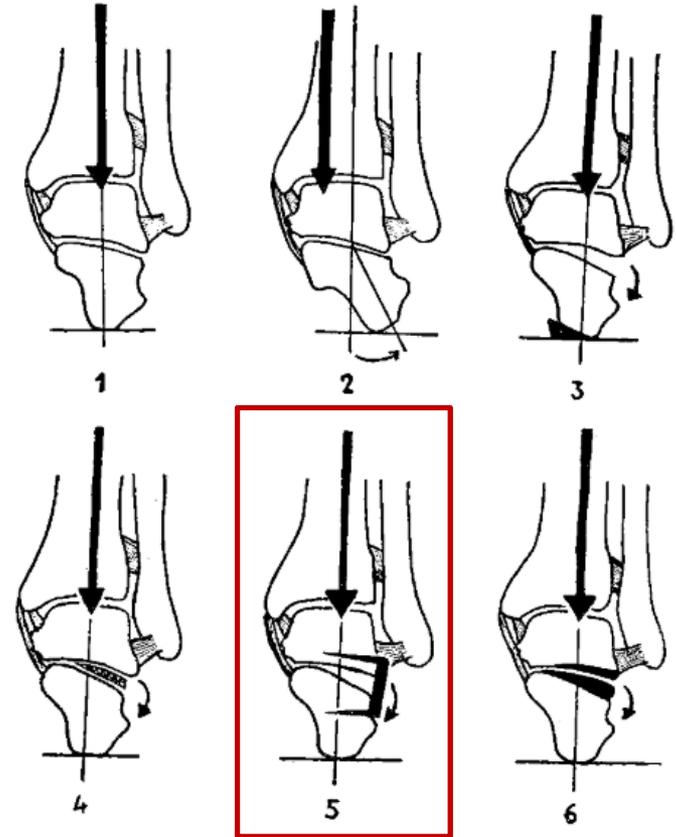
Alessio Bernasconi<sup>1</sup>  
François Lintz<sup>2</sup>  
Francesco Sadile<sup>1</sup>

## Lelièvre 1970: arthroereisis

4

### Current Concepts and Correction in the Valgus Foot

JEAN LELIÈVRE, M.D.\*

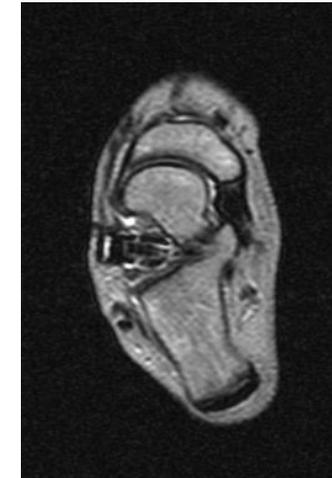




## The role of arthroereisis of the subtalar joint for flatfoot in children and adults

Alessio Bernasconi<sup>1</sup>  
François Lintz<sup>2</sup>  
Francesco Sadile<sup>1</sup>

## Subotnick 1974: primo mezzo di sintesi



## Effetto biomeccanico dell'artrosi

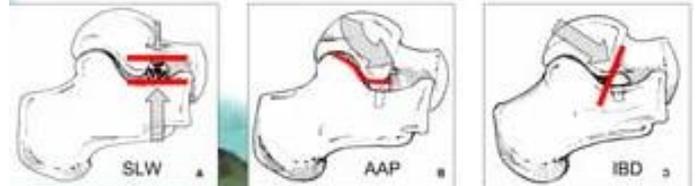
1. Limitazione della pronazione
  - a) Eversione calcaneare
  - b) Adduzione astragalica
  - c) Flessione plantare astragalica



### Biomechanical classification

(Vogler, 1987)

- Self-locking wedge (SLW)
- Axis-altering device (AAP)
- Impact-blocking device (IBD)



## < Clinical Research >

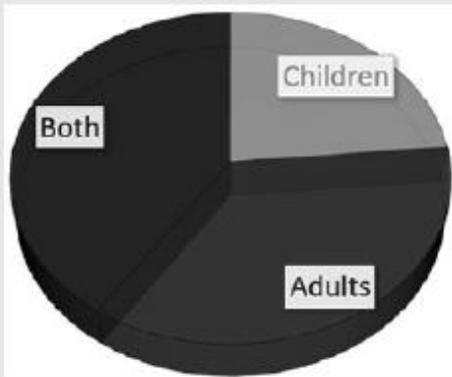
### 2013 Subtalar Arthroereisis Survey

#### The Current Practice Patterns of Members of the AOFAS

Neil S. Shah, MD, Richard L. Needleman, MD, Omais Bokhari, MD, and David Buzas, MD

**Figure 1.**

Whom Do You Perform This Procedure on?



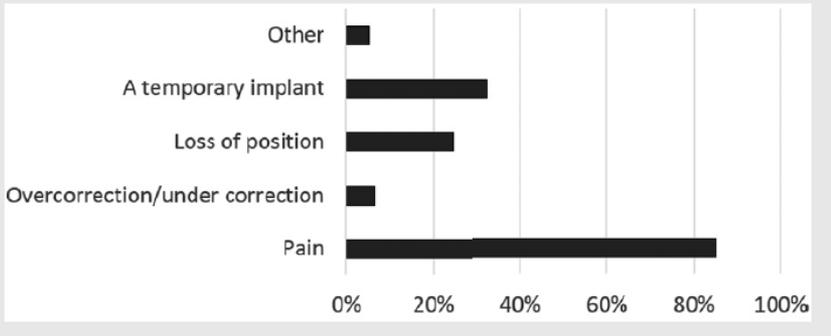
1. Painful congenital flatfoot
2. Flatfoot with accessory navicular
3. Posterior tibial tendon dys.

# Indicazioni cliniche

**Table 2.**  
Which Company/Implant(s) Do You Use?

Response		US Respondents, n = 116	Non-US Respondents, n = 122
By Company	By Implant		
Arthrex	ProStop	44	19
		16	14
Wright Medical	BIOARCH OrthoPro Subtalar Spacer System	12	8
		2	4
		1	0
Integra	Maxwell-Brancheau arthroereisis Kalix	7	5
		6	9
		0	24
Tornier	Futura Conical Subtalar Implant	4	0
		1	7
GraMedica	HyProCure	4	1
	Modified Silastic	2	0
Biomet		1	1
Solana Surgical		1	0
Stryker	SubFix	1	0
	"Screw(s)"	14	20
OsteoMed	Talar-Fit	0	5
	Calcaneo-stop	0	2
	Subtalar ARS	0	1
	Staples	0	2

**Figure 3.**  
Reasons for Removal of Implant.



# Indicazioni cliniche

Vol. 17, No. 1 Fall 2016 Special

< Clinical Research >

## 2013 Subtalar Arthroereisis Survey The Current Practice Patterns of Members of the AOFAS

Neil S. Shah, MD, Richard L. Needelman, MD, Umama Borkan, MD, and David Rusan, MD

### Past and Current Practice Patterns by Continent.

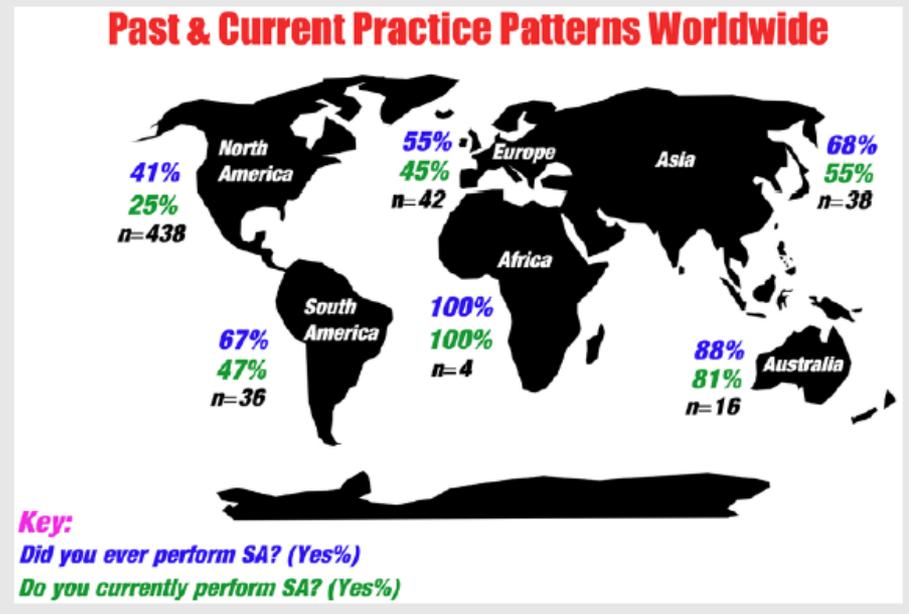
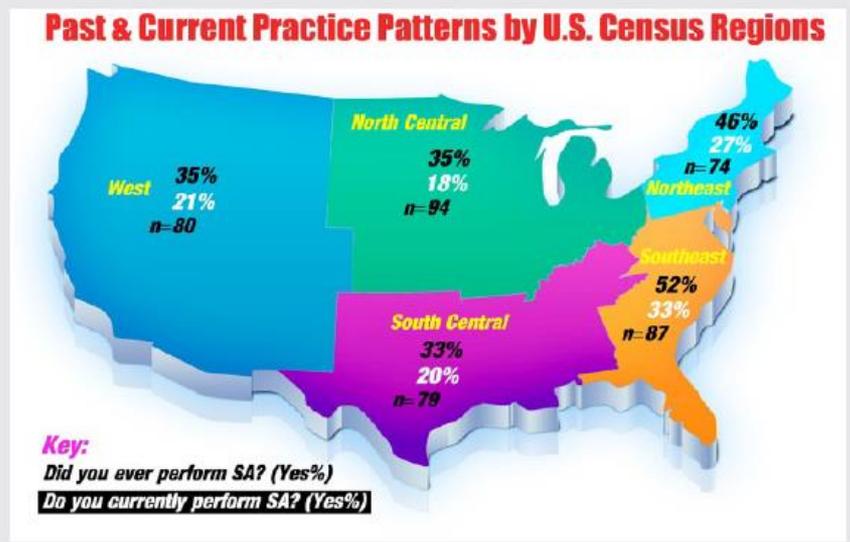


Figure 5.

Past and Current Practice Patterns by US Regions.



Abbreviation: SA, subtalar arthroereisis.

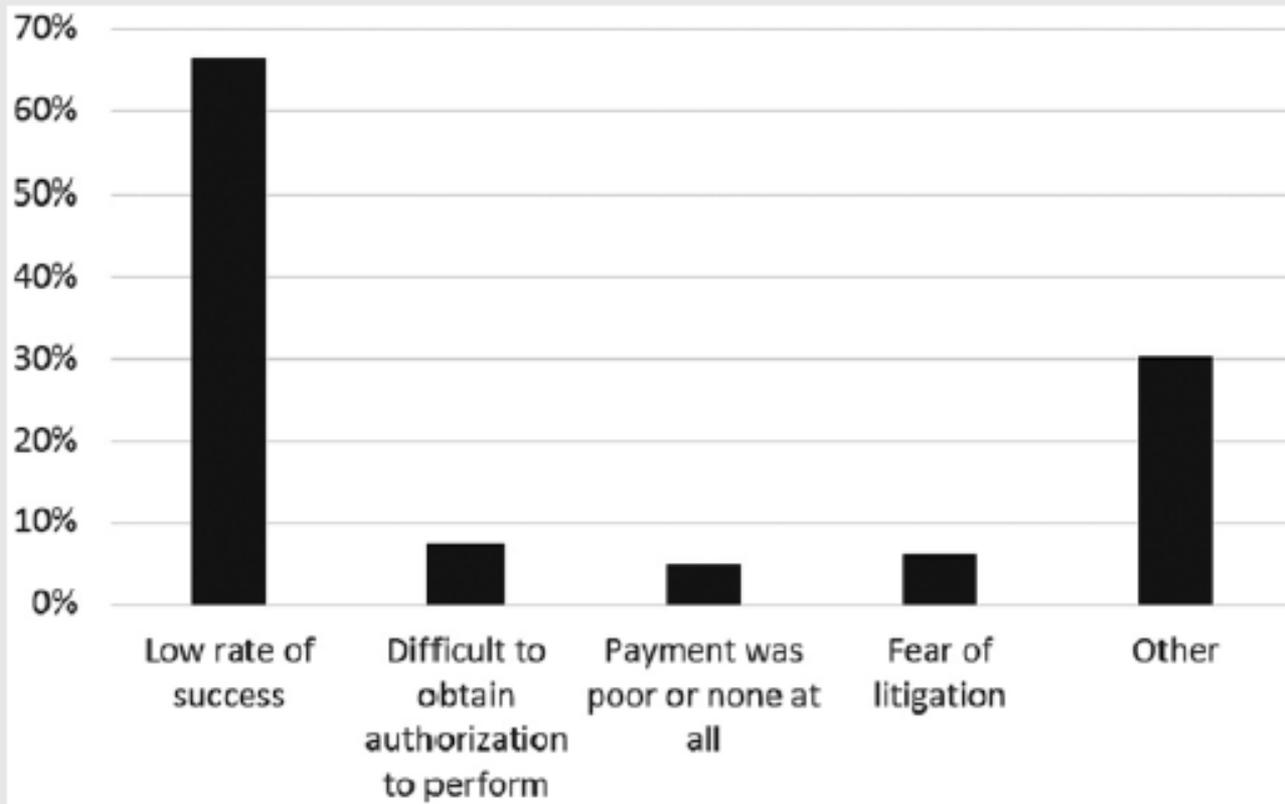
## 2013 Subtalar Arthroereisis Survey

The Current Practice Patterns of Members of the AOFAS

Neil S. Shah, MD, Richard L. Needleman, MD, Omama Bakhti, MD, and David Eagan, MD

**Figure 4.**

Why Did You Stop Performing This Procedure?





- 1. Limite tra piede piatto fisiologico e piede piatto patologico: oggetto di discussione**
- 2. Perché il «flexible flatfoot» diviene sintomatico?**
- 3. La cinematica del passo non differisce, ma soggettivamente è sintomatico.**
- 4. Se doloroso con limitazione attività' routinarie: ricerca di un allineamento meccanico**
- 5. 2017: no RCT , molti case series**
- 6. Subtalar arthroereisis: risultati incoraggianti ma poco chiare le indicazioni**

# Piede piatto idiopatico

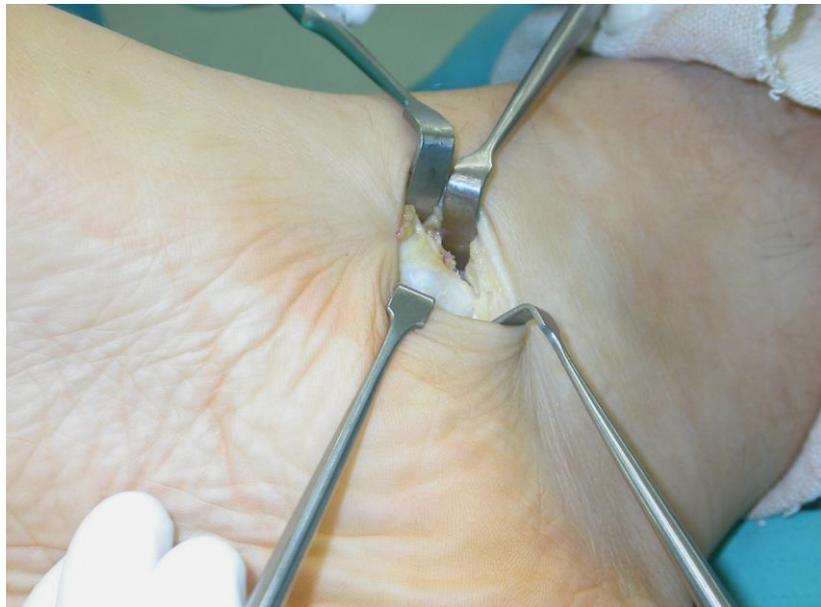


# Indicazioni cliniche

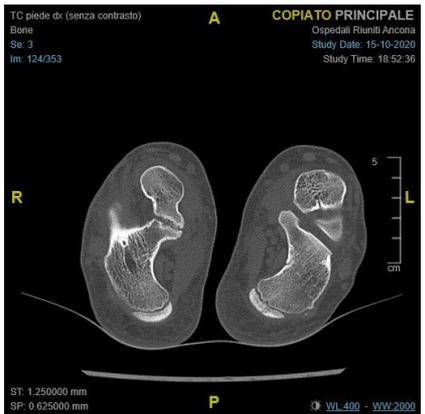


# Indicazioni cliniche





1. Piede piatto idiopatico sintomatico  
+/- tempi accessori.



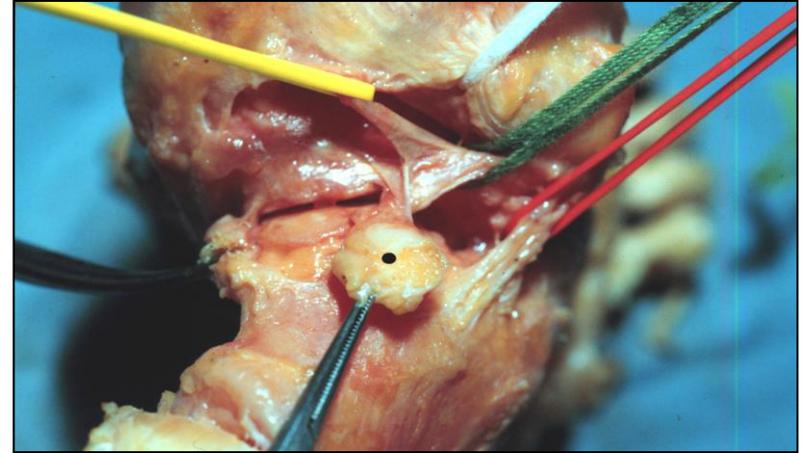
2. Piede piatto rigido da sinostosi astragalo-calcaneale , calcaneo-scafoidea.



### 3. Piede piatto acquisito dell'adulto



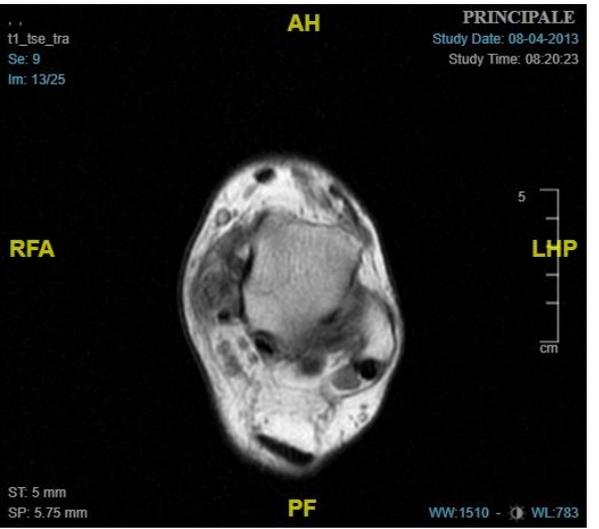
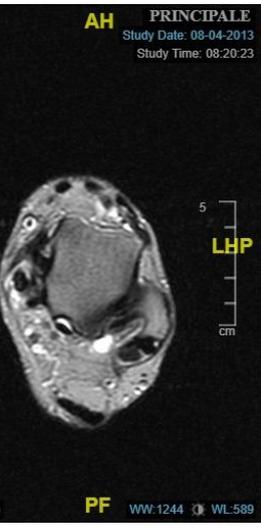
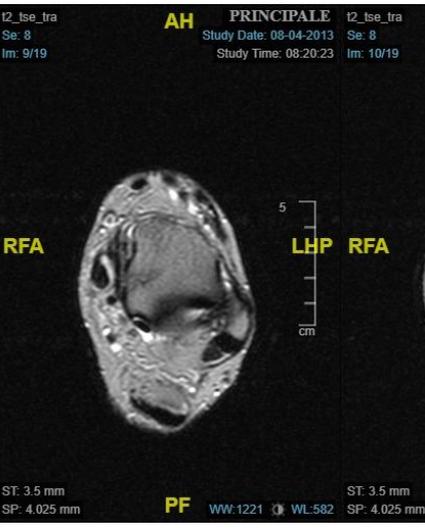
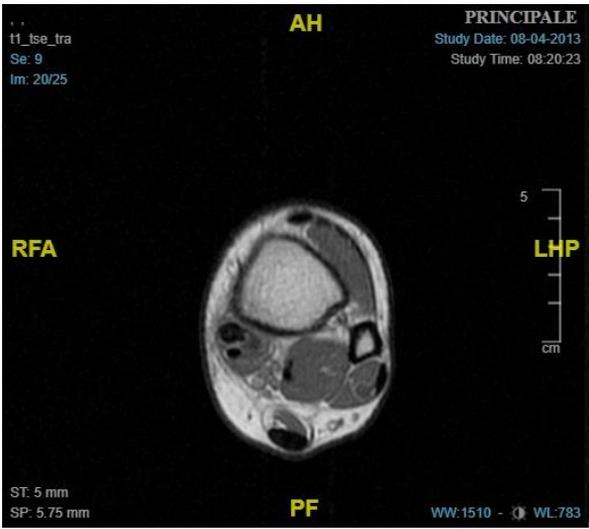
### Indicazioni cliniche



**Leg. Calcaneo-scafoideo**

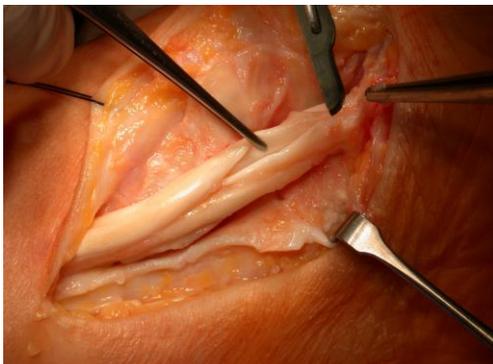
**Tendinopatia del tibiale posteriore**

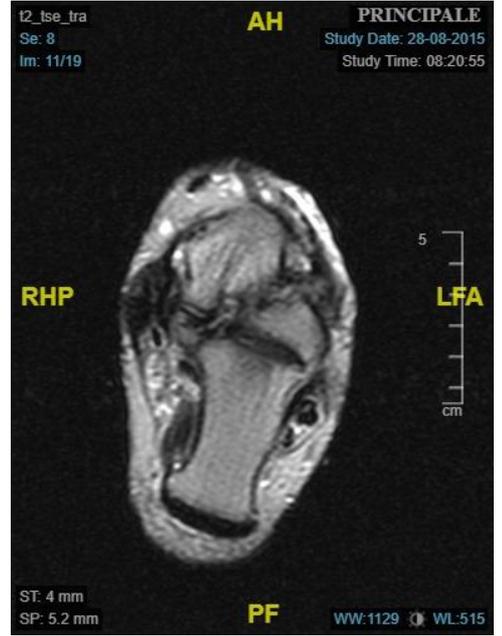
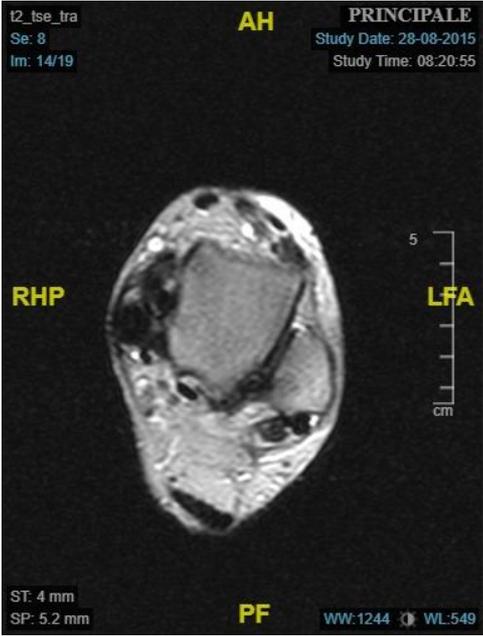
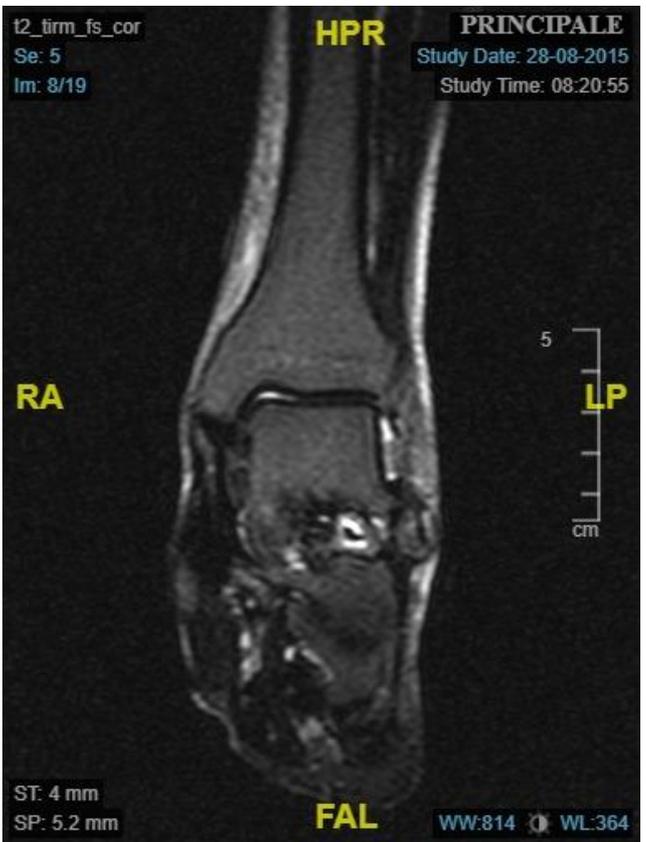




Maschio 25 06 1961

# Indicazioni cliniche

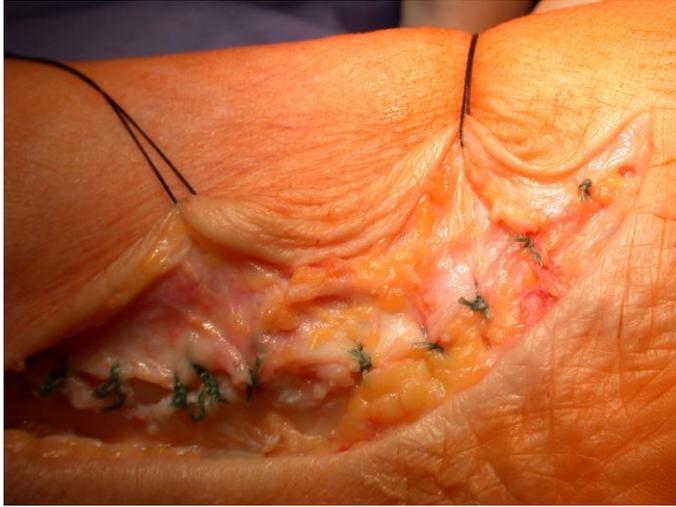




Follow up a 2 anni

# Indicazioni cliniche - alternativa

Maschio 02 02 1953





## The role of arthroereisis of the subtalar joint for flatfoot in children and adults

Alessio Bernasconi<sup>1</sup>  
François Lintz<sup>2</sup>  
Francesco Sadile<sup>1</sup>

**Table 1.** Benefits and drawbacks of subtalar arthroereisis reported in the current literature

Benefits	Drawbacks
<p><i>Compared with open traditional surgery</i></p> <ul style="list-style-type: none"> <li>- lower invasiveness (mini-incision)</li> <li>- decreased post-operative oedema</li> <li>- shorter hospital stays</li> <li>- possibility of performing associated soft-tissue and bony procedures</li> </ul>	<p>Quality of studies available is poor Data uncertain regarding:</p> <ul style="list-style-type: none"> <li>- complication rate</li> <li>- implant removal rate</li> <li>- need (and timing) of removal in absence of symptoms</li> <li>- comparison between implants</li> <li>- long-term results</li> </ul>

- 1. Nei bambini: grado C**
- 2. Negli adulti: anche se l'indicazione è diversa , grado C**

## Long-term clinical and radiological outcomes following surgical treatment for symptomatic pediatric flexible flat feet: a systematic review

Maria Anna SMOLLE, Martin SVEHLIK, Katharina REGVAR, Andreas LEITHNER, and Tanja KRAUS

Department of Orthopaedics and Trauma, Medical University of Graz, 8036 Graz, Austria

Correspondence: tanja.kraus@medunigraz.at

Submitted 2021-12-05. Accepted 2022-02-24.

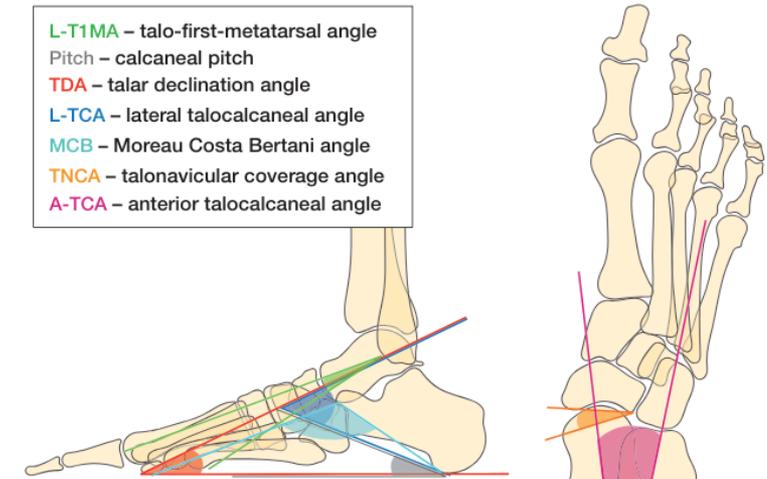


Figure 1. Graphical depiction of angles analyzed.

1. Poche complicanze
2. Risultati clinici ed RX buoni a lungo termine
3. Anche se non chiara la correlazione tra clinica ed Imaging
4. Critiche: studi poco significativi con poco follow up

**< Review >**

# Outcomes Following the Use of Subtalar Arthroereisis in the Correction of Adult Acquired Flatfoot

## A Systematic Review

Kwaku Wiredu Baryeh, MBBS<sup>1</sup>,  
Hiba Ismail, MSc,  
Anshul Sobti, MBBS, D.Orth, DNB (Orth),  
MCh (Orthopaedics), FRCS (Tr & Orth),  
and Ziad Harb, BM, MRCS DipSEM  
(UK&I), DipT&O, FRCS (Tr & Orth)

**Figure 2.**

(a) ProStop Subtalar Arthroereisis Implant from Arthrex, Naples, FL. (b) Kalix Implant from Integra LifeSciences, Princeton, NJ. (c) Horizon from BioPro, Port Huron, MI.



1. **Puo' rivelarsi utile come procedura aggiuntiva nel A.A.F.D. tipo II.**
2. **Ma studi molto eterogeni.**

## Prospective comparison of subtalar arthroereisis with lateral column lengthening for painful flatfeet

David Y. Chong<sup>a</sup>, Bruce A. MacWilliams<sup>b</sup>, Theresa A. Hennessey<sup>b</sup>, Noelle Teske<sup>b</sup> and Peter M. Stevens<sup>b,c</sup>

### 1. 12 mesi di follow up

### 2. Artrorisi utile alternativa ad osteotomia sec. Evans ( o artrodesi calcaneo-cuboidea )

International Orthopaedics  
<https://doi.org/10.1007/s00264-019-04303-3>

REVIEW ARTICLE



Lateral column lengthening versus subtalar arthroereisis for paediatric flatfeet: a systematic review

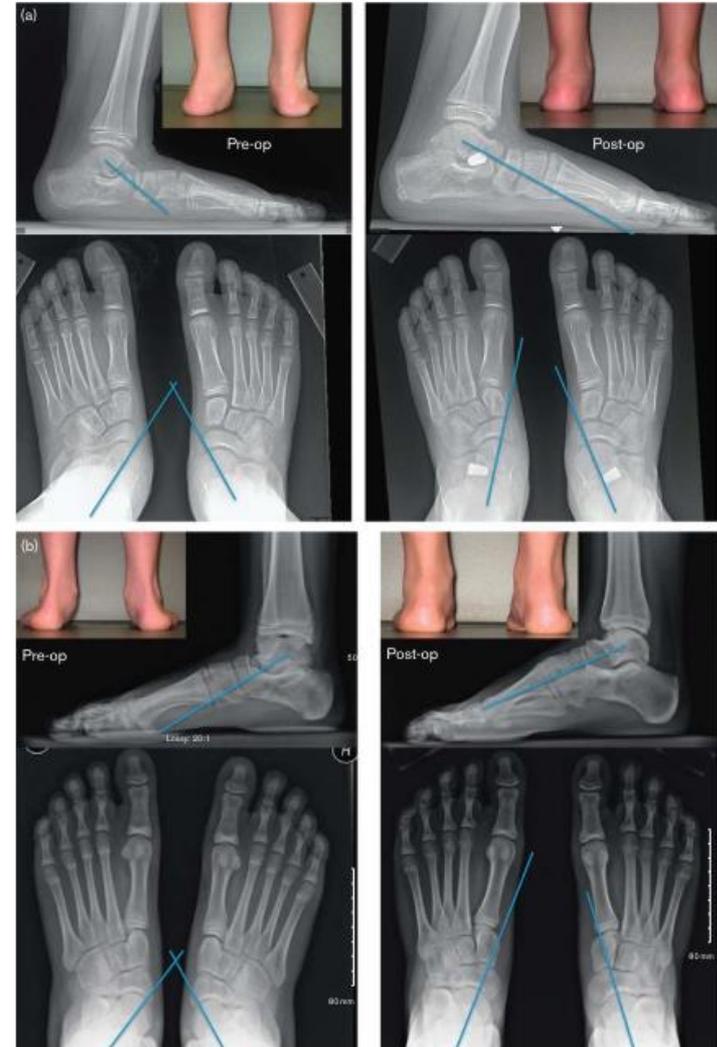
Dong Hun Suh<sup>1</sup> · Jung Ho Park<sup>1</sup> · Soon Hyuck Lee<sup>2</sup> · Hak Jun Kim<sup>3</sup> · Young Hwan Park<sup>3</sup> · Woo Young Jang<sup>2</sup> · Jung Heum Baek<sup>1</sup> · Hyun Jae Sung<sup>1</sup> · Gi Won Choi<sup>1</sup>

### 1. LCL: + correzione RX , + AOFAS score

### 2. Subtalar arthroereisis: - complicitanze, +/- re-interventi



Pediatric Orthopaedics B 2015, Vol 24 No 4



Clinical photographs and radiographs of the (a) subtalar arthroereisis group and (b) the lateral column lengthening group.

## Arthroereisis in juvenile flexible flatfoot: Which device should we implant? A systematic review of literature published in the last 5 years

Andrea Veschio, Gianluca Testa, Mirko Amico, Claudio Lizzio, Marco Sapienza, Piero Pavone, Vito Pavone

> J Pediatr Orthop B. 2022 Jan 1;31(1):e17-e23. doi: 10.1097/BPB.0000000000000881.

## Results of the Italian Pediatric Orthopedics Society juvenile flexible flatfoot survey: diagnosis and treatment options

Vito Pavone<sup>1</sup>, Andrea Veschio<sup>1</sup>, Antonio Andreacchio<sup>2</sup>, Antonio Memeo<sup>3</sup>, Cosimo Gigante<sup>4</sup>, Ludovico Lucenti<sup>1</sup>, Pasquale Farsetti<sup>5</sup>, Federico Canavese<sup>6</sup>, Biagio Moretti<sup>7</sup>, Gianluca Testa<sup>1</sup>, Maurizio De Pellegrin<sup>8</sup>

International Orthopaedics (2023) 47:2357-2368  
<https://doi.org/10.1007/s00264-023-05837-3>

ORIGINAL PAPER



## Flatfoot over the centuries: the background of current conservative and operative treatments

Carlo Biz<sup>1</sup>, Mariachiara Cerchiaro<sup>1</sup>, Fabiana Mori<sup>1</sup>, Alessandro Rossin<sup>1</sup>, Mattia Ponticello<sup>1</sup>, Alberto Crimi<sup>1</sup>, Pietro Ruggieri<sup>1</sup>

Review > Foot Ankle Clin. 2021 Dec;26(4):765-805. doi: 10.1016/j.fcl.2021.07.007.

Epub 2021 Oct 4.

## Subtalar Arthroereisis for Surgical Treatment of Flexible Flatfoot

Maurizio De Pellegrin<sup>1</sup>, Désirée Moharamzadeh<sup>2</sup>

> Int Orthop. 2021 Mar;45(3):657-664. doi: 10.1007/s00264-020-04911-4. Epub 2021 Jan 14.

## Long-term results of subtalar arthroereisis for the treatment of symptomatic flexible flatfoot in children: an average fifteen year follow-up study

Antonio Mazzotti<sup>1</sup>, Alberto Di Martino<sup>2,3,4</sup>, Giuseppe Geraci<sup>1</sup>, Cinzia Casadei<sup>1</sup>, Alessandro Panciera<sup>1</sup>, Sandro Giannini<sup>5</sup>, Cesare Faldini<sup>1,5</sup>

RESEARCH ARTICLE

Open Access

## Operative versus nonoperative treatment in children with painful rigid flatfoot and talocalcaneal coalition

Giovanni Luigi Di Gennaro<sup>1</sup>, Stefano Stallone<sup>1</sup>, Eleonora Olivotto<sup>2</sup>, Paola Zarantonello<sup>1</sup>, Marina Magnani<sup>1</sup>, Tullia Tavernini<sup>1</sup>, Stefano Stilli<sup>1</sup> and Giovanni Trisolino<sup>1\*</sup>



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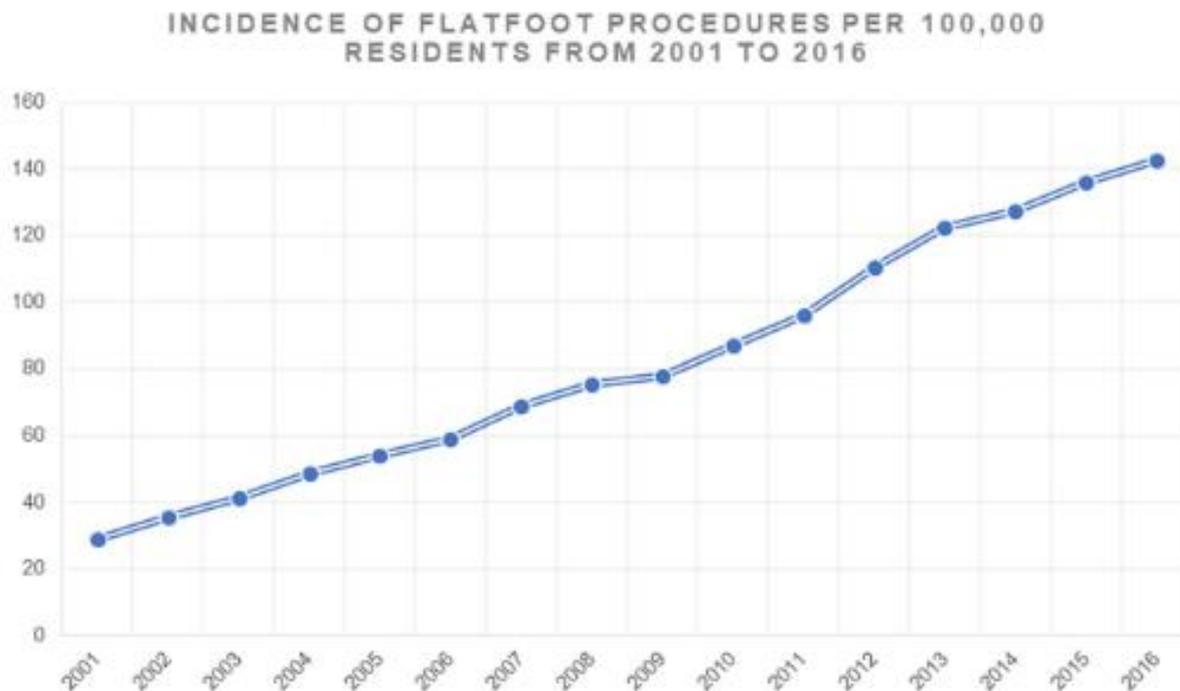
RESEARCH ARTICLE

Open Access

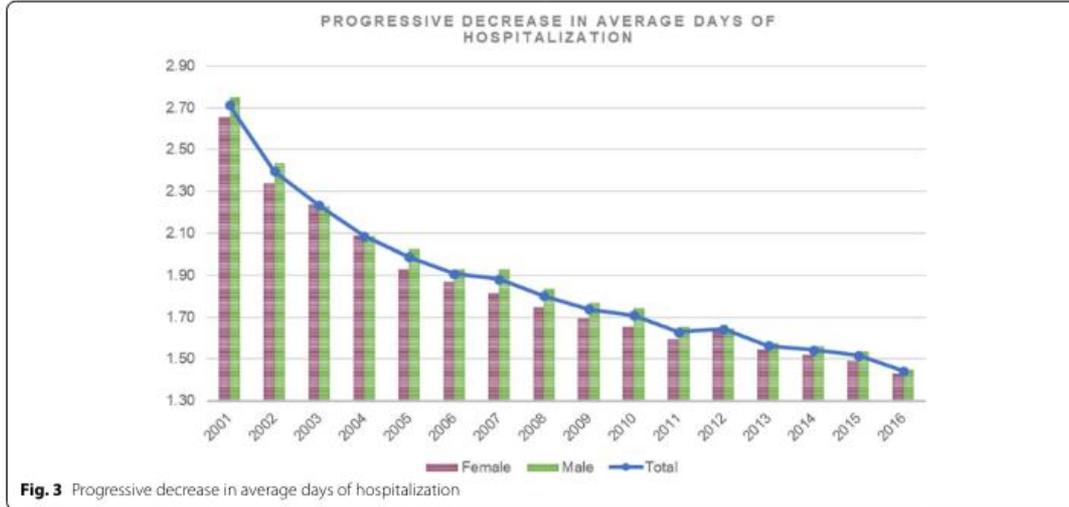


# Trends in hospitalization for paediatric flatfoot: an Italian nationwide study from 2001 to 2016

Umile Giuseppe Longo<sup>1,2,3\*</sup>, Rocco Papalia<sup>1,2,3</sup>, Sergio De Salvatore<sup>1,2,3</sup>, Laura Ruzzini<sup>4</sup>, Vincenzo Candela<sup>1,2,3</sup>, Ilaria Piergentili<sup>1,2,3</sup>, Leonardo Oggiano<sup>4</sup>, Pier Francesco Costici<sup>4</sup> and Vincenzo Denaro<sup>1,2,3</sup>



**Fig. 1** Incidence of flatfoot procedures  $\times$  100,000 resident from 2001 to 2016



- In aumento il “ **peso economico** ” della chirurgia del piede piatto
- Nella popolazione giovani si è passati:
  - da **28.9** nel 2001
  - a **142.7** ( $\times 100,000$  ab.) interventi per piede piatto

# Conclusioni



