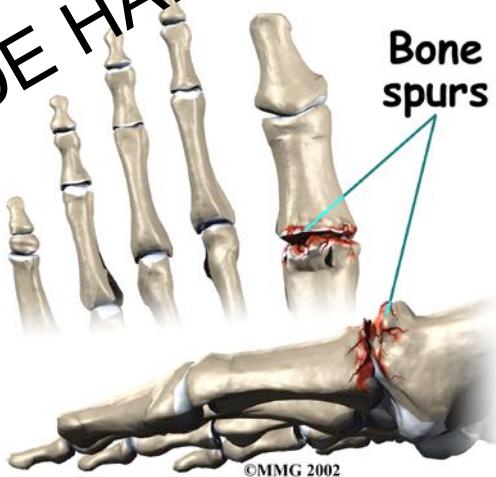


HALLUX RIGIDUS CHEILECTOMY

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Dr J de Halleux

september 2013

WICH TREATMENT FOR HALLUX RIGIDUS?

- CONSERVATIVE

- local inflammatory process
 - NSAIs
 - infiltration
- MTP 1 dorsiflexion (>< dorsal impingement)
 - Stiff-soled shoe
 - Full-length insert
(thin spring-steel full length)
 - Avoid high heel shoes

- SURGICAL:

- Never restore normal anatomy and ROM!
- Goals :
 - Relief dorsal impingement
 - Lessen synovitis

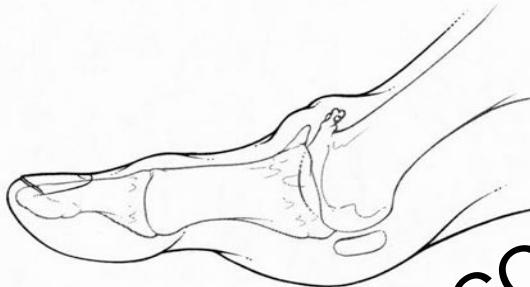


SURGICAL TREATMENT FOR HALLUX RIGIDUS

- Cheilectomy
 - Keller
 - Arthrodesis
 - Prosthesis
 - Möberg
 - MT1 Osteotomy (*Youngswick-Austin, Watermann, Green Watermann*)
 - Capsular interposition arthroplasty
 - extracellular matrix interposition arthroplasty
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CHEILECTOMY: INTRODUCTION



- **Cheilos = lip in gree..**
- **More than removing dorsal lip**
 - *Bad results if only resection of excrescence of reactive bone(*) (**)*
- **Described by Duvries in 1959 (***)**
- **First results by Mann and associates (****)**
 - *Proliferative bone resection to allow 45° dorsiflexion*
 - *N=20; FU=68 months; 90% good results; CP: hallux valgus and recurrence*

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* Nilsonne H: Hallux Rigidus and its treatment. Acta Orth Scand, 1930

** Bonney and Macnab,: Hallux valgus and hallux rigidus: a critical survey of operative trresults. JBJS BR, 1952

*** Duvries: Hallux rigidus. In Duvries:Surgery of the Foot, 1959

**** Mann and al: Hallux Rigidus: a review of the litterature and a method of tretment. Clin Orthop, 1979

CHEILECTOMY : INDICATION* **

First line surgical treatment option for HR grades 1^{c2} and selected 3



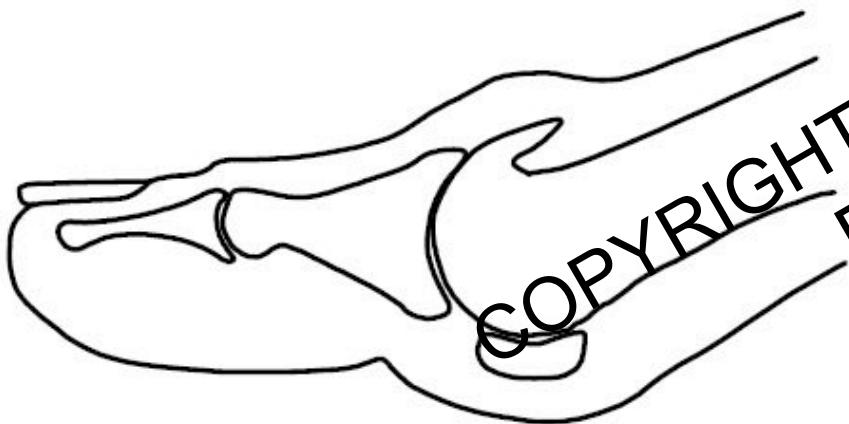
* Simpson A et al, *Surgical strategies: Hallux Rigidus surgical techniques*. Foot and Ankle int, 2011

** Coughlin et al, *Hallux Rigidus. Grading and long term results of operative treatment*. JBJS, 2003

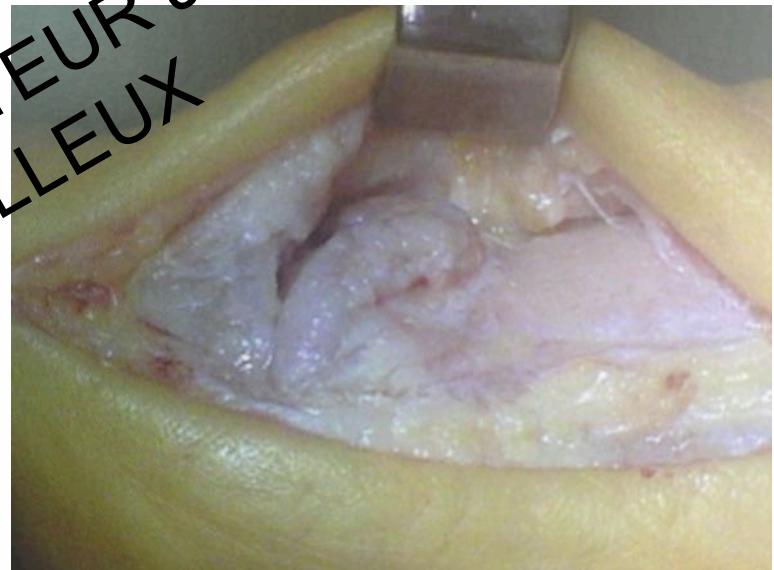
CHEILECTOMY: SURGICAL TECHNIQUE

DuVries technique (Mann) *

- dorsal MTP1 longitudinal incision
- EHB mobilized laterally
- dorsal longitudinal capsulotomy
- Synovectomy, removal loose bodies
- Plantar MTP1 flexion :good exposure



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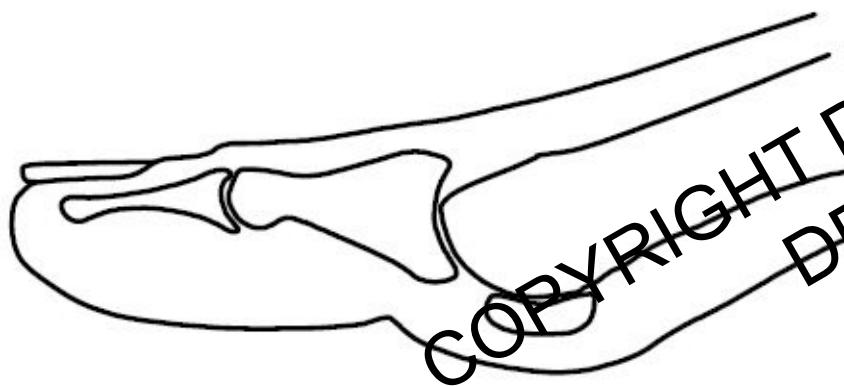
* Mann R : Hallux Rigidus. Instruct Course Lect 1990

CHEILECTOMY: SURGICAL TECHNIQUE

DuVries technique (Mann) *

- Osteophytectomy

- dorsal = from the MT1 head at union intact cartilage and dorsal bone eburnation
- medial and lateral



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* Mann R : Hallux Rigidus. Instruct Course Lect 1990

CHEILECTOMY: SURGICAL TECHNIQUE

DuVries technique (Mann) *

- Need to have 70 to 90° perop passive dorsiflexion
 - *only 50% of ROM maintained in postop*
 - *need to remove up to 1/3 of the MT1 head*
- Bone wax
 - *decrease hematoma formation interfering with postop ROM*
- capsule is close
- Postop : Barouk shoe, bandage for 4 week and early mobilisation



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* Mann R : Hallux Rigidus. Instruct Course Lect 1990

CHEILECTOMY: RESULTS

Hattrup and Johnson (*)

- n=58 (53 patients)
- Preop Xray graduation scale I to III
- **Results : good : 72,4%**
 - 53,4% *completely satisfied*
 - 19% *mostly satisfied*
 - 27,6% *unsatisfied*
- **better results in early Xray stages**
 - *Failure rate in group with Xray*
 - stadium I = 10%
 - stadium III = 37,5%
- **Conclusion :** procedure of choice for Xray grade
 - I = cheilectomy
 - II and III = arthrodesis
- **Discussion :** in this serie, dorsal bony resection = **in the line with the MT shaft** (lesser than Mann)

* Hattrup and Johnson: subjective results of hallux rigidus following treatment with cheilectomy. Clin Orthop 1988.

CHEILECTOMY: RESULTS

- Mann and Clanton (*)

- Material: n =31; FU = 56 months
- Technique: Proliferative bone resection to **allow preop 70°** passive dorsiflexion



- Results: Cheilectomy is better than arthrodesis or arthroplasty

<u>Pain</u> 90,3% better	
- Complete relief of pain	22/31
- Considerable relief of pain	6/31
- No relief of pain	2/31
- Worse	1/31

<u>ROM</u> 75% better	
- Better	23/31
- Unchanged	5/31
- Decreased	3/31

* Mann adn Clanton: Hallux rigidus by cheilectomy. JBJS Am, 1988

CHEILECTOMY: RESULTS

Easley and all *

- n= 68 (52 patients); FU = 5 years
- cheilectomy with **medial approach**
(release plantar capsule and sesamoid apparatus)
- **Results :**
 - global satisfaction rate = 90%
 - AOFAS hallux rating = 45,1 to 85,4 points
 - dorsiflexion improvement = 19,8° to 38,7°
(high grades, but lesser in Xray grade III)
- **Discussion :**
 - resection lateral osteophytes = more difficult
 - hallux valgus may occur with medial approach (early motion in postop)

*Easley, Davis, Anderson: Intermediate to long term follow-up of medial approach dorsal cheilectomy for hallux rigidus. *Foot and Ankle Int* 1999.

CHEILECTOMY: RESULTS

	Postop XRay progression	Postop Need for arthrodesis
XRay Stage I	Yes	No
XRay stage II	Yes	No
XRay stage III	Yes	25%

Progression Xray grade after cheilectomy

- grade I preop : progression to grade II = 53% (no need for arthrodesis)
to grade III = 35% (no need for arthrodesis)
- grade II preop : progression to grade III = 62% (no need for arthrodesis)
- grade III preop : only (25%) need to have arthrodesis

*Easley, Davis, Anderson: Intermediate to long term follow-up of medial approach dorsal cheilectomy for hallux rigidus. Foot and Ankle Int 1999.

CHEILECTOMY: RESULTS

- **Coughlin, 2003 (1)**
 - Favorable results if early stages (I, II and selected III stages) of HR
- **Seibert et al (3)**
 - gold standard treatment» for mild to moderate HR
- **Lau et al (4)**
 - Group A of patients HR grade 2 treated by cheilectomy
 - Group B of patients HR grade 3 treated by interpositional arthroplasty
 - Satisfaction and function rate better in group A
- **Coughlin et al (5)**
 - Cheilectomy
 - does not alter degeneration process
 - does allow patients increased comfort

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(1) Coughlin et al, Hallux Rigidus. Grading and long term results of operative treatment. JBJS, 2003

(2) Mann R, Clanton: Hallux rigidus: treatment by cheilectomy. JBJS, 1988

(3) Seibert et al: surgical management of hallux rigidus: cheilectomy and osteotomy(phalanx and metatarsal. FAI, Nam, 2009

(4) Lau et al: outcomes following cheilectomy and interpositional arthroplasty in hallux rigidus. FAI, 2001

(5) Coughlin et al: Hallux Rigidus: grading and long term results of operative treatment. JBJS, 2003

CHEILECTOMY : COMPLICATIONS ***

- **Recurrence**
 - exostoses
 - advancement of osteoarthritis
 - Easley et al *: 30%
 - Coughlin et al **: increasing rate of degeneration
- **Infection**
- **Neuroma formation**
- **Paresthesias hallux**
- **Complex regional pain syndrome**

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* Easley et al Easley, Davis, Anderson: Intermediate to long term follow-up of medial approach dorsal cheilectomy for hallux rigidus. *Foot and Ankle Int* 1999.

** Coughlin et al, Hallux Rigidus. Grading and long term results of operative treatment. *JBJS*, 2003

*** Simpson A et al, Surgical strategies: Hallux Rigidus surgical techniques. *Foot and Ankle int*, 2011

CHEILECTOMY :COMPLICATIONS

Complications:

- Possibility to have progression MTP degeneration
- excessive bone resection : MTP instability
- Insufficient bone resection : impingement

Treatment:

- Arthrodesis (Coughlin and Shurnas *, Brage et al**)
- Risk of pseudarthrosis higher after cheilectomy
(Myerson and Schon***)

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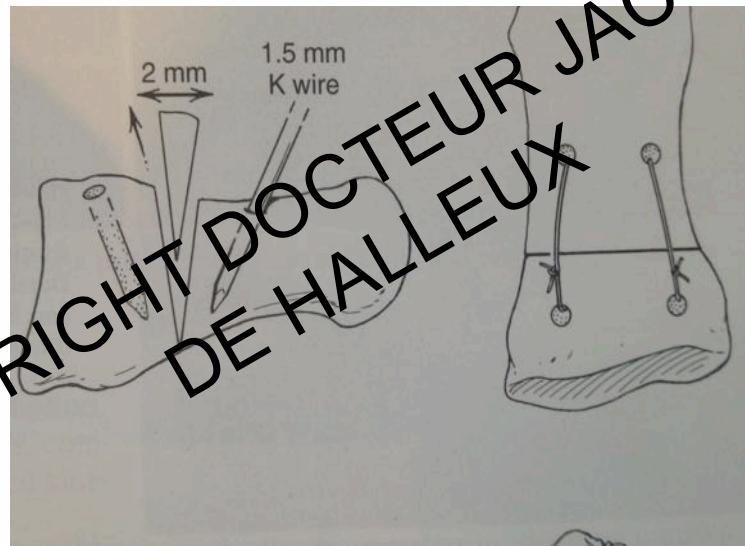
* Coughlin and Surnas:Hallux Rigidus: surgical techniques (cheilectomy and arthrodesis).J+BJS, 2004

** Brage et al:Surgical optionfor salvage of end stage hallux rigidus . Foot Ankle Clinic,2002

*** Myerson et al: Results of arthrodesis of the hallux metatarsophalangeal joint using bone graft for restoration of lenght. Foot Ankle Int, 2000

MOBERG OSTEOTOMY

- 1952 : Bonney and Macnab *
- **Aim:** more MTP1 dorsiflexion
 - *Only if normal preop plantar MTP1 flexion*

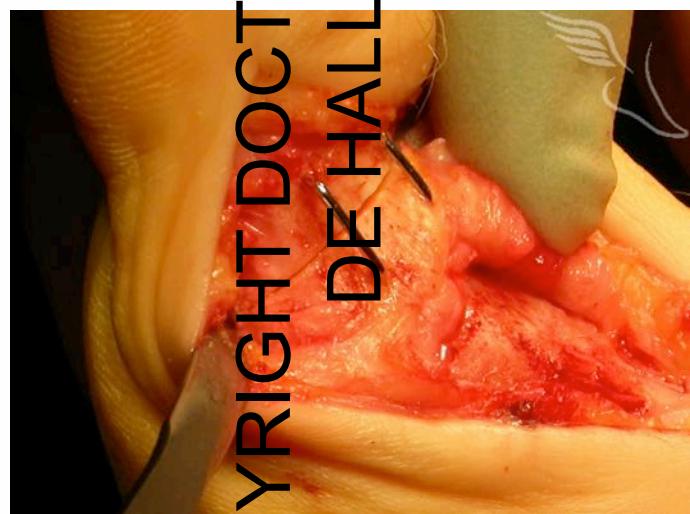
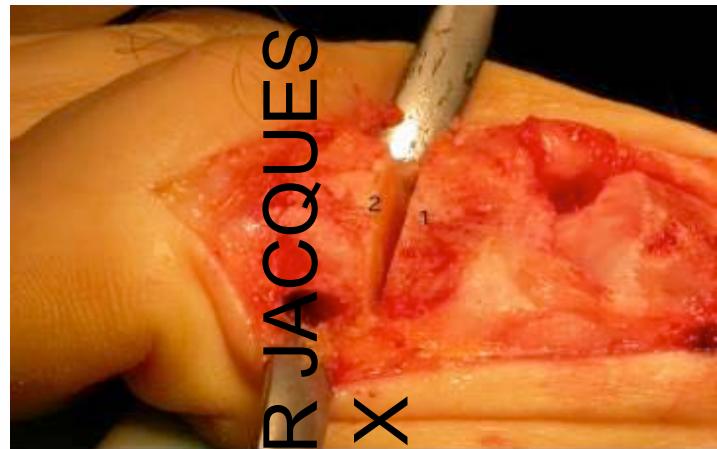


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*Bonney and Macnab: Hallux valgus and hallux rigidus: a critical survey of operative results.
J Bone Joint Surg Br, 1952

MÖBERG OSTEOTOMY: SURGICAL TECHNIQUE

- To do after the cheilectomy
 - *risk of osteotomy displacement when MTP1 plantarflexion*
- Dorsal approach prolonged distally
- Dorsal closing wedge osteotomy :
 - *proximal cut 1cm distal to the MTP joint*
 - *Amount bony wedge 3mm at the dorsal base*
 - *!!!not violate plantar cortex : more stability*
- Dorsiflexion maneuver : close the osteotomy
- Fixation : staple, screw, suture (Myerson M*)
- Postop : early mobilisation
 - *but no MTP1 plantar flexion (risk of displacement)*

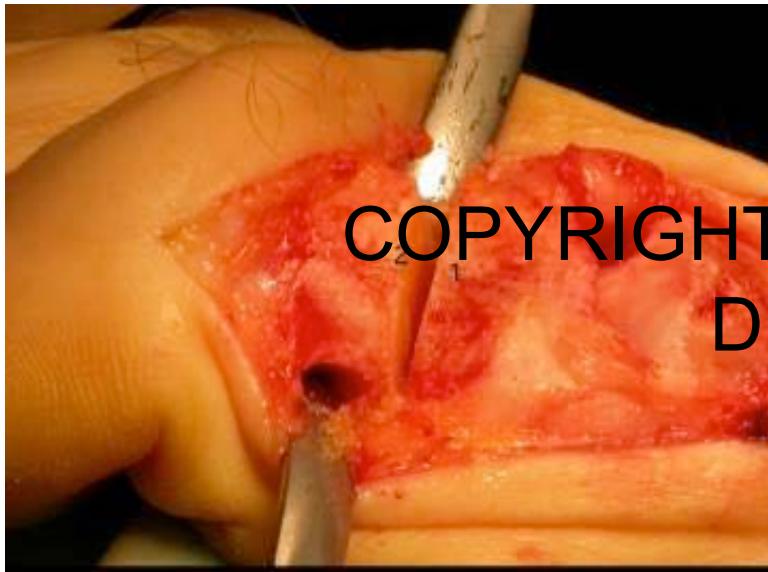


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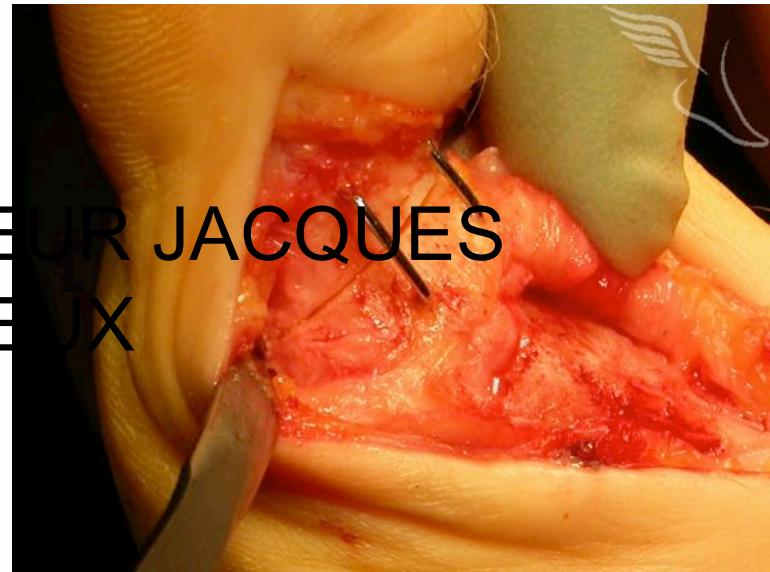
* Myerson, personal communication, 1995

MOBERG OSTEOTOMY ALONE : RESULTS

- **Kessel and Bonney *:**
 - n=10; excellent results
- **Citron and Neil **:**
 - n=10; FU=10 y;
 - 5 symptom free, 1 need arthrodesis
 - « treatment of choice for HR without arthritic changes »



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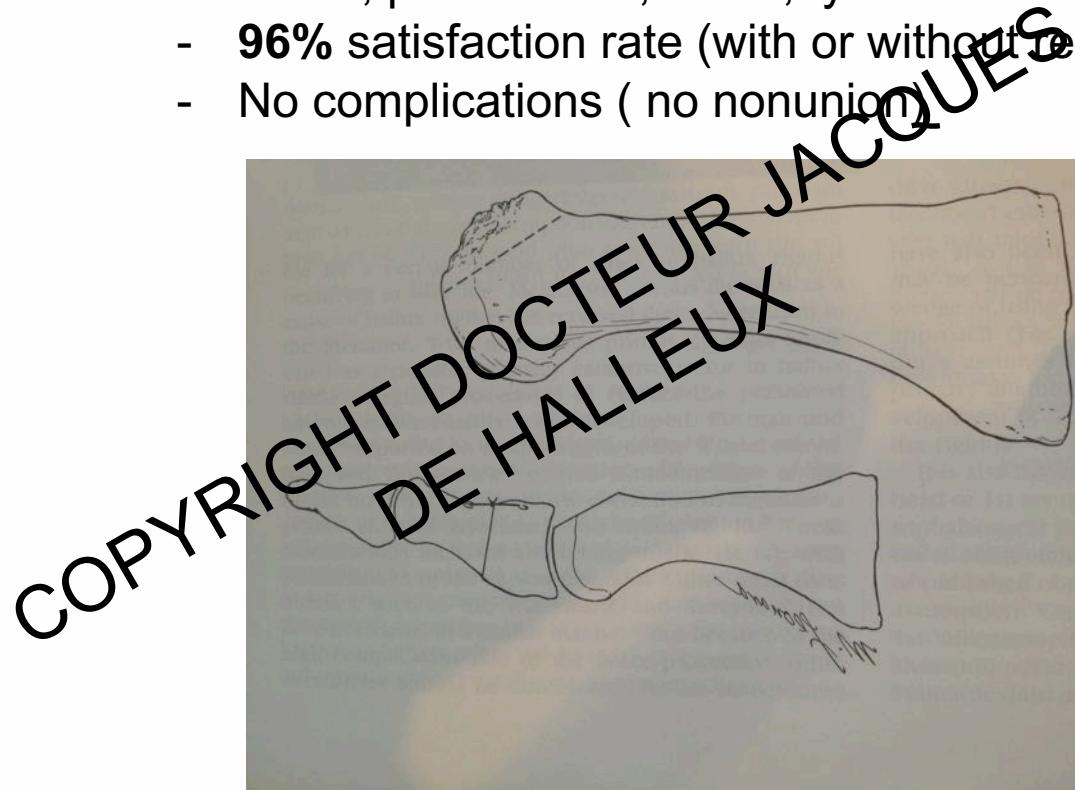


* Kessel and Bonney: Hallux Rigidus in the adolescent. *J Bone Joint Surgery Br*, 1958

** Citron and Neil: Dorsal wedge osteotomy of the proximal phalanx for hallux Rigidus: long term results.
J Bone Joint Surg Br, 1987

CHEILECTOMY and MÖBERG OSTEOTOMY: RESULTS

- Aim = better MTP1 ROM
- Smith *
 - n=27; patients=20; FU=5,2y
 - 96% satisfaction rate (with or without reservation)
 - No complications (no nonunion)



* Smith RW and al: Cheilectomy with proximal phalanx osteotomy for surgical treatment of hallux rigidus.
Foot Ankle Int, 1999

CHEILECTOMY: CONCLUSION

- Simple to perform
- First line surgical treatment option for HR grades 1, 2 and selected 3
- Need to have 70° to 90° perop passive dorsiflexion
 - only 50% of ROM maintained in postop
 - need to remove up to ~~1/3~~ of the MT1 head



CHEILECTOMY: CONCLUSION

- Results :
 - Cheilectomy
 >90% good results
 - Cheilectomy + Möberg
osteotomy >95% good result
 - MTP1 dorsiflexion improvement
 >20°
- Cheilectomy does not alter
degeneration process
- If bad results : R/ arthrodesis or
arthroplasty

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CHEILECTOMY: RESULTS

Keogh and all (*)

- n=20
- 90% succes rate
- ROM MTP1 increase of 20°
- Preop Xray graduation scale I to III : 2 failures = grade I

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*Keogh P, Nagaria J, Stephens M: Cheilectomy for hallux rigidus. Ir J Med Sci, 1992

CHEILECTOMY: SURGICAL TECHNIQUE

DuVries technique (Mann) *

- dorsal MTP1 longitudinal incision
- EHB mobilized laterally
- dorsal longitudinal capsulotomy
- Synovectomy, removal loose bodies
- Plantar MTP1 flexion : good exposure
- Osteophytectomy
 - *dorsal = from the MT1 head at union intercartilage and dorsal bone eburnation*
 - *medial and lateral*
- Need to have 70° to 90° postop passive dorsiflexion (*only 50% of ROM maintained in postop*)
 - *need to remove up to 1/3 of the MT1 head*
- Bone wax
 - *decrease hematoma formation interfering with postop ROM*
- capsule is close
- Postop : Barouk shoe, bandage 4 week and early mobilisation

* 49 Mann and al,

CHEILECTOMY : INDICATION* **

First line surgical treatment option for HR grades 1^{c2} and selected 3

not for advanced stages 3 or stages 4 (needs more sacrificing techniques)

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- Simpson A et al, *Surgical strategies: Hallux Rigidus surgical techniques*. Foot and Ankle int, 2011
- **Coughlin et al, *Hallux Rigidus. Grading and long term results of operative treatment*. JBJS, 2003