

Treatment of the chronic lateral instability of the ankle by an original procedure. About 32 cases. **Marchaland JP**, Mathieu L, Ollat D, Barbier O, Versier G.

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Abstract:

Introduction: The authors present the results of a surgical technique for lateral ankle chronic instability, derived from Castaing and Duquenois procedures. It uses a half peroneus brevis with a tightening of the antero- lateral capsule.

Material and methods: Thirty- two 28 years middle-aged patients have been reviewed with a delay of 32 months (12 to 68). Stress X-Ray in varus of the both ankles (measure of tibio talar angle, arthritis) and had a strength measure in eversion have been performed. The functional evaluation was performed with Molander and Olerud ankle score.

Results: After surgery, no patient had instability of the ankle. At revision, the functional score was 90 against 59 at the pre operative time. The difference of strength in eversion between the two ankles was about 7 percent. Laxity had a good correction seeing the average tibio talar angle between the both ankles is 0, 5 degree.

Discussion: The results of this procedure show a distinct improvement of stability, radiological laxity and functional activity. The arthrotomy performed in Duquenois procedure, is useful for the diagnosis and the treatment. It shows the cartilage and allows the removal of impingement and foreign bodies. A plasty that uses the single evertor deprives the ankle of a part of active and proprioceptive control. However, the patients didn't feel a difference or a discomfort. The patients who had the surgery on the jump foot side had no significative difference of strength in eversion between the both ankles.

Conclusion: This anatomical procedure gives 91 percent of satisfaction, for these active young people. The postoperative physiotherapy allows the complete recovery of activities from the sixth month after surgery.

Key words: ankle instability, ligamentoplasty, laxity, evertor, proprioception

Treatment of the chronic lateral instability of the ankle by an original procedure.

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I- Introduction

The chronic lateral instability of the ankle is a frequent cause of stopping sports. For military people, it causes important problems, mainly because of a loss of physical activity in their job and sports.

II- Material and methods

1- Material: Thirty- six patients have been operated between 2002 and 2005 for a chronic lateral instability of ankle. About 50 percent of them had more than 10 sprains before surgery. This population (1 ♀ / 7 ♀), 28 years middle aged (18 to 36 years) had a bilateral instability in 25 percent of the cases, a hyper laxity in 40 percent of the cases and a sub talar instability in 6 percent of the cases.

At the pre operative time, the average differential varus (bilateral stress X-Rays) was 5 degrees (-3 degrees to 15 degrees). The MRI showed besides a lesion of the lateral collateral ligament, 2 lesions of the talo crural ligament but no osteochondral defect on the talus.

The time between the 1st sprain and the surgery was about 84 months (12 to 180).

The surgical technique has been achieved in supine position with a tourniquet by a lateral approach on fibula. It associated in any case (Figure 1):

- A ligamentoplasty with a half tendon of the peroneus brevis detached of the muscle, crossing through a malleolar tunnel then sutured on itself one centimetre over the basis of the fifth metatarsal after crossing through the antero lateral capsule.

- A capsular tightening like DUQUENNOY by a detachment of the antero lateral capsule, intra - articular exploration and bony attachment (Malleolar tunnel (\emptyset 2) or anchors).

In case of an associated sub talar instability (2 patients), we performed a scraping out of the tarsal sinus of the tarsus, a capsular plasty and a plasty with the extensorum digitorum brevis.

For post operative cares, a below knee plaster cast during 45 days was followed by progressive weight bearing and a proprioceptive physiotherapy in a rehabilitation center. The recover of sport was allowed between the fourth and the sixth month after surgery.

The complications of 21 percent were mainly scar disorders and algodystrophy.

2- Revision: The revision concerned the professional and sporty recovering (C.L.A.S.), the subjective assessment and the ankle scoring system of Molander and Olerud. (Figure 2)

The clinical exam valued the foot morphology, the motion and the hyper laxity.

The strength of the peroneus brevis of the both ankles has been measured with a dynamometer; and bilateral stress X- rays have been performed in order to measure the differential varus. (Figure 3)

The statistical study has been achieved thanks to the Epi-info software 6.04 (Center Disease Control, USA) distributed by the ENSP Rennes- France (National School of Public Health). A comparative analysis of the data has been performed with the Khi2 test (significant data if $p < 0, 05$). When the values were lower to 5, a statistical correction was made by the Fischer test.

III- Results

1- Global Result

a- Professional and sport recovering: Twenty- eight patients (32 ankles) have been reviewed with an average of 32 months followup (12 to 68). Eighty percent of them had a profession with risks of sprains for the ankle (paratroopers, legionnaires, firemen, and gendarmes). All of them recovered the same work.

Ninety- eight percent of the patients recovered the sport but three with a lower level. The individual sports as running was often increased at the expense of collective sports which were responsible of the previous instability. (Figure 4)

b- Subjective assessment (Figure 5)

Ninety- one percent of the patients were satisfied or very satisfied. No recurrence of sprains has been reported. The reasons of dissatisfaction were the pain (21 percent), the stiffness (15 percent), the apprehension (6 percent) and the complications (3 percent).

c - Clinical exam: There was not any significative difference between the two ankles in the motion in dorsal or plantar flexion. Nine percent of the patients had a calcaneus varus.

d- Ankle scoring system of Molander et Olerud: The ankle score was improved significantly at the post operative time (92 versus 56 at the preoperative time) ($p < 0, 05$). We observed a slight but not significant stiffness after surgery. (Table I)

e - Strength in éversion: We observed a loss of 5 percent of strength in eversion on the operated side but it was not significant.

f - Differential varus: The laxity in varus has been very improved (4, 8 degrees at the pre operative time versus 0, 6 degree at revision) ($p < 0, 05$).

Moreover, there was no tibio talar osteoarthritis.

2 - Analytic results

a - Satisfaction: The pain, the stiffness and the loss of strength affected the subjective result ($p < 0, 05$); on the other hand, the age and the sport activity had no influence.

b - Ankle score: The ankle score was lower for the patients over 28 years old and in case of complications or stiffness. The notion of apprehension, the importance of the preoperative instability had no influence.

c - Sensation of stiffness and morphology of the hind foot: With regard to the stiffness, the subjective assessment has been confirmed by the clinical exam but not by the stress X- Rays. Moreover, calcaneus varus was not responsible for pain or apprehension.

IV - Discussion

The association of these two techniques can provide the advantages of the both. Each one can compensate the disadvantages of the other one. The main advantage of the hemi - Castaing is

a lasting efficiency; the inconvenience is the sacrifice of a part of the peroneus brevis and a stiffening of the subtalar joint bothersome in sportsmen.¹ Even if our technique didn't show, for the most part, any significant loss of strength of the ankle, the patients who had a loss of strength, felt it and were disappointed. The Duquenois provides a diagnostic and therapeutic arthrotomy but one blames it for a progressive pulling.¹ In term of recover of activities, subjective and functional results, our data is comparable to the data presented recently.² (Table II). They are also comparable to those of the other techniques:¹ Karlsson,³ Roy Camille,⁴ and ligamentoplasties with the peroneus brevis as Chrisman Snook⁵ and Watson Jones.⁶

In many sets, we can observe a high rate of complications;² in our study, we didn't have any recurrence of sprains, known in the Duquenois, thanks to the hemi Castaing.

In order to prevent scars disorders, it is fundamental to spare sub cutaneous detachments.

Because of algodystrophy, we decreased the time of immobilization to three weeks instead of six. We know that the stiffness gives a less good functional result. We can explain it by an over correction by an excessive pulling on the graft by the surgeon. And we know that the ability of stretching of the peroneus brevis is lower than the collateral lateral ligament.¹

That's why, we recommend keeping in mind to let a small varus when pulling the graft

V- Conclusion

The results of this study with military patients, so people who make a lot of physical activities, gave very good results, with no recurrence.

The frequent stiffness leads us to be careful with the tightening of the graft.

VI- References

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Illustrations

Figure 1: Surgical technique

1a



1b



1c



1d



1a: Lateral approach

1b: The peroneus brevis

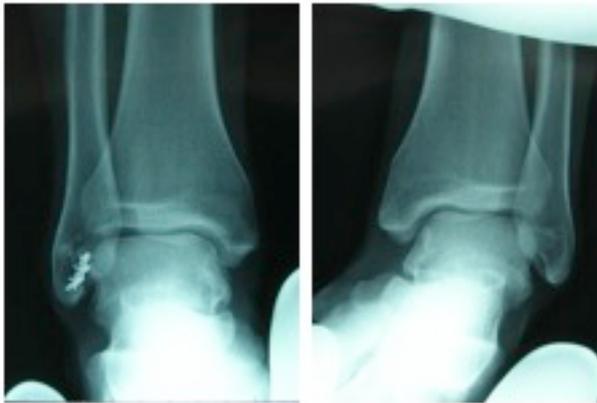
1c: A Half peroneus brevis crossing through a malleolar tunnel.

1d: Suture of the peroneus brevis on itself and capsular tightening

Figure2: Ankle scoring system of Molander and Olerud

The ankle scoring system of Olerud and Molander (1984)	
	Score
Pain	
None	25
Walking on uneven surface	20
Walking on even surface	10
Walking indoors	5
Constant and severe	0
Stiffness	
None	10
Stiffness	0
Swelling	
None	10
Evenings	5
Constant	0
Stair-climbing	
No problems	10
Impaired	5
Impossible	0
Running	
Possible	5
Impossible	0
Jumping	
Possible	5
Impossible	0
Squatting	
No problems	5
Impossible	0
Supports	
None	10
Tape, wrapping	5
Stick or crutch	0
Work, activities of daily living	
Same as preinjury	20
Reduced	15
Change of job	10
Severely impaired	0
Total	100

Figure 3: Revision



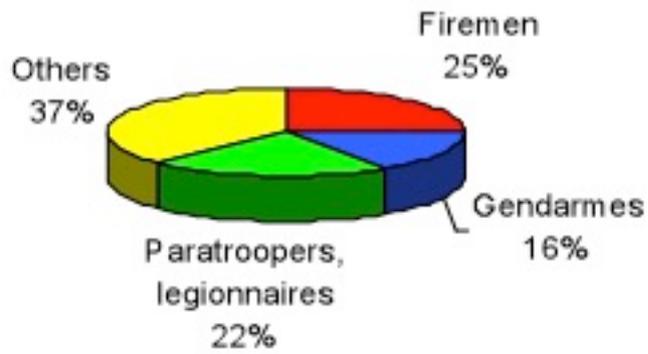
3a: Stress X- Rays



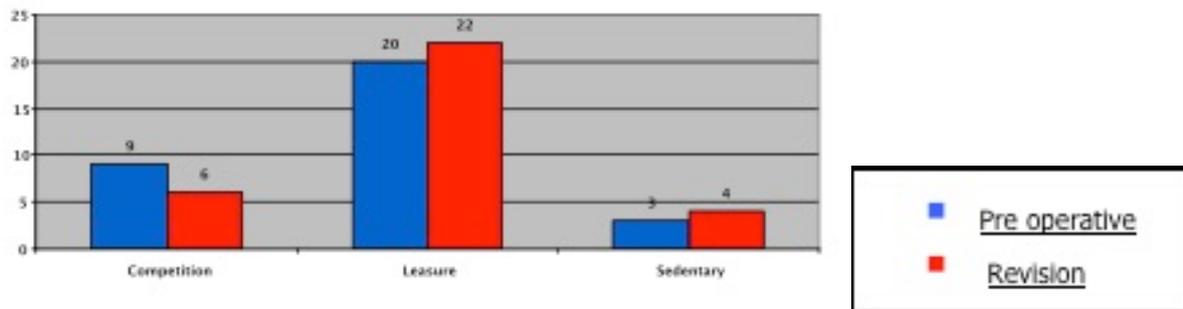
3b: Strength in eversion (3 measures- same examiner)

Figure 4: Recovery of job and sports

4a: Job



4b: Sport level



4c: Types of sports

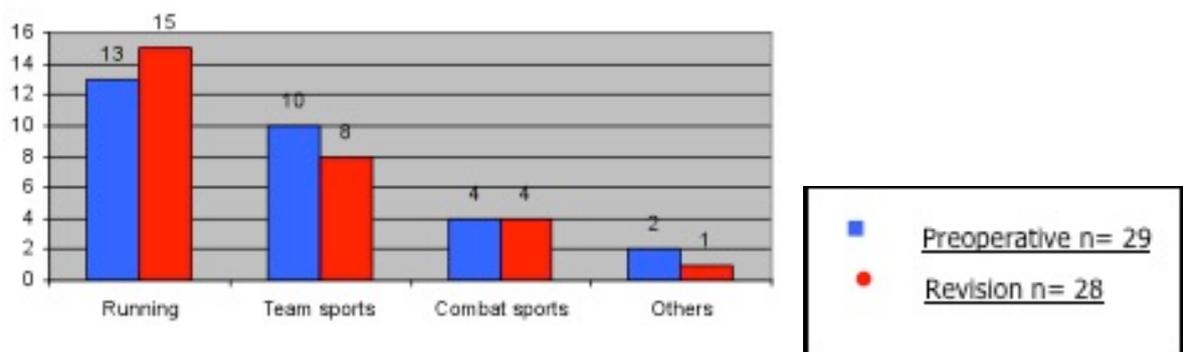


Figure 5: Subjective assessment

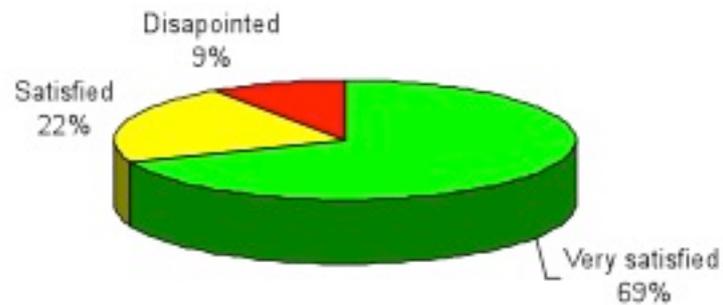


Table I: Ankle score of Molander and Olerud

	Preop score	Revision score	Correlation
Pain (25 points)	10,5	21,3	P<0,05
Stiffness (10 points)	8,5	7,9	NS
Edema (10 points)	5,3	8,9	P<0,05
Stairs (10 points)	7,8	10	P<0,05
Sports (10 points)	3,6	9,1	P<0,05
Help (10 points)	6,2	9,8	P<0,05
Activity (25 points)	15,1	24,1	P<0,05

Table II: Comparison with SOO 2005

	131 Hemi- Casting	76 Duquennoy	Our study
% recover of sport	82 %	80 %	97 %
% satisfied and very satisfied	91 %	80 %	91 %
Average ankle score	85,5	90,3	91,5