

# An Alternative Repair Operation For Recurrent Dislocation Of Peroneal Tendons

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## Abstract

**Background:** Subluxation or dislocation of the peroneal tendons over the lateral malleolus is uncommon and, therefore, often misdiagnosed as an ankle sprain.

**Objective:** We are reporting the case of a patient who had recurrent dislocation that was treated by reconstruction of the peroneal retinaculum with calcaneofibular ligament using a different surgical technique.

**Method:** In our surgical procedure we defined a new osteotomy line 1.5 centimeters above the calcaneofibular ligament at an angle of 30 degrees with the horizontal plane.

**Result:** As the calcaneofibular ligament is mobilized together with a lateral malleolus which is refixed in its original site after rerouting, no scarring or adhesions to the peroneal tendons developed. Also fixation of the osteotomy area with tension band wiring technique permitted us early movement.

**Conclusion:** This distinguishes our procedure from the many others. According to our knowledge no other techniques defined like ours method in the literature.

## INTRODUCTION

Subluxation or dislocation of the peroneal tendons over the lateral malleolus is uncommon and, therefore, often misdiagnosed as an ankle sprain. The peroneal tendons are held in the malleolar groove by the superior peroneal retinaculum. The retromalleolar groove is variable in length and depth, and a shallow groove is a predisposing factor of dislocation of the peroneal tendons. Tearing of the superior peroneal retinaculum with dislocation or subluxation of the peroneal tendons usually occurs with the foot in dorsiflexion as a result of a vigorous contraction of the peroneal tendons. This mechanism is most occur in skiers. Also the cause may be idiopathic. According to some authors; a forceful peroneal contraction is essential and the foot may be in either dorsiflexion or plantar flexion. When the dislocation becomes recurrent, there are mainly complaints of a painfull "click" and instability of the ankle. We are aware of the controversy around treating the acute injury conservatively or primary repair; however when the dislocation becomes recurrent and symptomatic; secondary

repair is the treatment of the choice. In chronic cases conservative measures (Bragard 1934) are unsatisfactory and surgical treatment is better.

There are several different methods of secondary repair; bony procedures; such as Kelly or DuVries technique; osteoperiosteal flaps; and tendoplasty or tendon slings (plantaris or Achilles tendon slip), retinaculoplasty, groove deepening procedures, and rerouting procedure. They all have advantages or disadvantages.

We are reporting the case of a patient who had recurrent dislocation that was treated by reconstruction of the peroneal retinaculum with calcaneofibular ligament using a different surgical technique. In the literature we found no description of the use of our technique for reconstruction.

## CASE REPORT

A thirty six years old woman who complained of pain, popping and snapping about the lateral malleolus operated. She was a house wife and the symptoms had been present

for twenty three years. Because of low socioeconomical situation; she didn't seek medical care at that time. She said that she did not have any trauma such as ankle distortion or tendinitis (Figure 1-2). So that we thought it was idiopathic.

On examination, she had tenderness to direct palpation over the peroneal tendons. With forced eversion and plantar flexion of the foot, she could readily cause the tendons to snap anterolaterally over the lateral part of the fibula. For reconstruction of the superior peroneal retinaculum, the calcaneofibular ligament is used. The incision was begun at a point approximately ten centimeters proximal to the tip of the lateral malleolus and was continued parallel to the posterior margin of the distal part of the fibula to the tip of the lateral malleolus. The incision then curved anteriorly to within three centimeters of the base of the fifth metatarsal, continuing in line with the tendon of peroneus longus. The posterior and anterior aspects of the lateral malleolus were exposed. The residual part of the superior peroneal retinaculum over the peroneal tendons was incised longitudinally in the area of the distal one-fourth of the fibula, permitting exposure of the peroneal tendons. Calcaneofibular ligament was exposed. The osteotomy line was signed 1.5 centimeters above the calcaneofibular ligament (Figure 3-4). Then oblique osteotomy was performed proximal to distal at an angle of 30 degrees within the horizontal plane through the joint. The osteotomized bone block from the distal portion of the lateral malleolus is then mobilised and peroneal tendons are brought under the ligament from inner side of the malleolus. Later the bone block is replaced and fixed with tension band wiring technique. (Two 1.5 mm Kirshner pins and 1.5 mm cerclage wire. Figure 5-6.).

The leg was immobilized in a short-leg non weight bearing cast for three weeks after the operation. After this time, range-of-motion exercises and exercises that emphasized strengthening of the peroneal muscles begun. At the sixth week of operation, the patient was permitted to walk. At follow up the patient was evaluated clinically and radiographically. At the second year of operation the implants were removed.

The patient was able to resume full activities in her life two months after the operation. Thirty four months after the repair, she was asymptomatic. The strength of the peroneal muscles was equal bilaterally.

### **DISCUSSION**

Factors that contribute to the relatively high incidence of

recurrent dislocation include congenital or acquired laxity of the peroneal retinaculum and the absence of a groove in the fibula or the presence of a convex surface on the posterior aspect of the malleolus.

In our technique for reconstruction we used the calcaneofibular ligament like some other authors. We avoid disturbing it. Also we did not transpose the ligament to a different site. Instead of dividing the calcaneofibular ligament or the peroneal tendons, we osteotomized the fibula proximal from the ligament. We thought that; bone consolidation may be an advantage instead of ligament healing.

Most treatment procedures involve the peroneal retinaculoplasty or deepening of the fibular groove. In 2005 Title, Jung and colleagues reported a biomechanical study about pressure reduction after the peroneal groove deepening procedure. They used twelve fresh-frozen foot and ankle specimens. They put a thin pressure strip under the distal, middle and proximal groove and evaluated the pressure changes before and after the operation. They tested the pressures at the different positions of the ankle. Significant decreases in pressure were noted within the distal and middle groove at all ankle positions after the procedure. They concluded that; pressures within the middle and distal peroneal groove significantly decreased after a groove deepening procedure. They thought that; combining this technique with peroneal tendon debridement may be advantageous for treatment of partial peroneal tendon tears or recalcitrant peroneal tendinitis.

In 2005 Porter, McCarroll and colleagues reported their results in 13 athletes. Operative treatment involved removing a bone flap from the distal posterior fibula, deepening the posterior fibular groove, and reattaching the bone flap within the deepened groove. The superior peroneal retinaculum also was reconstructed. At an average follow-up of 35 months, no recurrent subluxation or dislocation of the peroneal tendons had occurred. They concluded that this procedure is reliable for preventing recurrent peroneal tendon instability.

In 2001 Mendicino and colleagues reported a different fibular groove deepening technique for recurrent peroneal subluxation. They deepened the peroneal groove by 3-8 mm routinely via intramedullary drilling and cortical impaction. They thought that this procedure is also technically simple with excellent results.

In 2000 Stukenborg-Colsman and Wirth reported 3 cases

which they resected the peroneus brevis tendon for peroneal clicking. In three patients, a peroneal click was found without symptoms of dislocation of the tendons over the fibula. Post operatively, no pain, swelling and peroneal click were present. They thought that, the partial loss of function of the peroneal brevis tendon seem to be negligible.

In 1998 Hui and colleagues reported the long term results after the Singapore operation for recurrent dislocation of peroneal tendons. The Singapore operation; first described in 1985, is an anatomical repair based on the Bankart-like lesion seen in the superior peroneal retinaculum. The normal anatomy is restored by obliteration of the false pouch and suturing of the incision in the peroneal retinaculum. They reviewed 21 patients after a mean follow-up of 9.3 years, and found no recurrence. They found that eighteen had good functional results and had returned to their previous levels of vocational and sports activities. The three fair results were due to painful scars or neuromas.

In 1997 Kollias and Ferkel reported twelve ankles that they operated with the fibular grooving procedure. Eleven ankles were rated as excellent results. They concluded that the fibular grooving procedure appears to reproducibly alleviate resubluxation of the peroneal tendons and diminish pain.

Some authors have also reported rerouting procedures using the calcaneofibular ligament. In 1967, Platzgummer described a technique in which the calcaneofibular ligament itself was simply divided and then sutured after rerouting the tendons. Division of the calcaneofibular ligament is considered a disadvantage. The integrity of the ligament was disturbed.

In 1968, Leitz published a modification of Platzgummer's technique in which he performed a rerouting procedure after osteotomizing the tip of the lateral malleolus where the ligament is attached. He tried to avoid the disadvantage of dividing the calcaneofibular ligament. This technique requires K- pin fixation for refixing the malleolus after transposition of the calcaneofibular ligament to the lateral side of the peroneal tendons. A disadvantage of this method is that the osteotomy is near the articular surface of the fibula and the tip of the malleolus had to be fixed.

Recently Pöll and Duijfjes reported a series of ten ankles in which they reconstructed the superior peroneal retinaculum by transposing the calcaneofibular ligament and mobilizing the calcaneal insertion with a bone block. This technique

requires internal fixation as well. They noticed that a further disadvantage of the other methods is the possibility of adhesions forming between the tendons and the ligament or bone. They believed that; the cancellous bone block with the insertion of the calcaneofibular ligament will reincorporate in the calcaneus without any problem and the integrity of this strong and important ligament is maintained.

Martens and Noyez reported their results in 11 cases that they operated with rerouting method. They incised the peroneal tendons in a Z fashion and brought them under the calcaneofibular ligament. Then they sutured them. They found that their technique is simple one with a low morbidity, yielding good results. Also in 1975 Sarmiento and Wolf divided the peroneal tendons, rerouted them underneath the calcaneofibular ligament and repaired them. In both studies division of the peroneal tendons is in our opinion a disadvantage of this method.

Mason and Henderson concluded that superior peroneal retinacula repair, with or without fibular rotational osteotomy, is a successful technique in treating both acute and recurrent instability of the peroneal tendons. It can be combined with a Brostrom repair when there is concurrent peroneal tendon and anterolateral ankle instability.

### **CONCLUSION**

In our surgical procedure we defined a new osteotomy line 1.5 centimeters above the calcaneofibular ligament at an angle of 30 degrees with the horizontal plane. As the calcaneofibular ligament is mobilized together with a lateral malleolus which is refixed in its original site after rerouting, no scarring or adhesions to the peroneal tendons developed. Also fixation of the osteotomy area with tension band wiring technique permitted us early movement. This distinguishes our procedure from the many others. According to our knowledge no other techniques defined like ours method in the literature.

In all of the procedures that uses the calcaneofibular ligament for reconstruction, have advantages and disadvantages. According to us; our technique is effective, usefull and less disturbing than the others. This new surgical technique can be kept in the mind as an alternative choice of treatment.

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## References

1. Bonnin JG. Injuries to the ankle. London: William Heinemann Medical Books Ltd. 1950.
2. Watson Jones R. Fractures and other bone and joint injuries. Edinburgh: E.& S. Livingstone.1940.
3. Bragard K. Bandage gegen luxation der Peroneal sehnen. Münchener Medizinische Wochenschrift. 1934; 81: 2,008.
4. Kelly RE. An operation for the chronic dislocations of the peroneal tendons. British J. Surg. 1920; 7: 502-504.
5. DuVries HL. Surgery of the foot. St Louis CV Mosby. 1959; 253-255.
6. Title CI, Jung HG, Parks BG, Schon Lew C. The Peroneal groove deepening procedure. A biomechanical study of pressure reduction. Foot Ankle Int. 2005; June 26(6): 442-448.
7. Porter D, McCarroll J, Knapp E, Torma J. : Peroneal tendon subluxation in athletes. Fibular groove deepening and retinacular reconstruction. Foot Ankle Int.2005; Jun 26(6): 436-441.
8. Mendicino RW, Orsini RC, Whitman SE, Catanzariti AR. Fibular groove deepening for recurrent peroneal subluxation. J Foot Ankle Surg. 2001; Jul-Aug 40(4): 252-263.
9. Stukenborg Coltsman C, Wirth CJ. Resection of the tendon of the peroneal brevis muscle in "clicking" peroneal tendons-a report of 3 cases. Z Orthop Ihre Grenzgeb. 2000; May-Jun 138(3): 265-268.
10. Hui JH, Das De S, Balasubramaniam P. The Singapore operation for recurrent dislocation of peroneal tendons: long term results. J Bone Joint Surg Br. 1998; Mar 80(2): 325-327.
11. Kollias SL, Ferkel RD. Fibular grooving for recurrent peroneal tendon subluxation. Am J Sports Med. 1997; May-Jun 25(3): 329-335.
12. Platzgummer H. Über ein einfaches Verfahren zur operativen Behandlung der habituellen peroneaussehnen luxation. Arch Orthop Unfall Chir.1967; 61:144-150.
13. Leitz G. Modification des von Platzgummer an gegebenen verfahrens zur operativen Behandlung der habituellen peroneaussehnen luxation. Arch Orthop Unfall Chir. 1968; 64: 245-251.
14. Pöll R, Duijffjes F. The treatment of recurrent dislocation of the peroneal tendons.J Bone Joint Surg.1984; 66B: 98-100.
15. Marc A Martens, Jan F. Noyez . Recurrent dislocation of of the peroneal tendons. The American Journal Of Sports Medicine. 1986; 14: No.2.
16. Sarmiento A, Wolf M. Subluxation of peroneal tendons. Case treated by rerouting tendons under calcaneofibular ligament. J Bone Joint Surg.1975; 57A: 115-116.
17. Mason RB, Henderson JP. Traumatic peroneal tendon instability. Am J Sports Med.1996; Sep-Oct 24(5): 652-658.

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