Chronic Ankle Instability

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- Abstract -

1. Biomechanical bases in Ankle Sprain

1) Mortise
   Semi-stable joint(Bony stability)
   Talar shape ; 원추형(frustrum, cornical)
2) Lateral ligaments complex support
   Anterior talo-fibular ligament at planatr flexion
   Calcaneofibular ligament at Foot flat
   Posterior talo-fibular ligament
3) Syndesmosis
   Ligaments networks
   Anterior Tibiofibular ligament
4) Tendons
   Peroneal tendon(longus, brevis); evertor & plantar flexor

2. Management of Acute Ankle Sprain

1) PRICE period ; acute inflammation
2) ROM period
3) Strengthening period; Peroneal & Extensor muscles
4) Endurance period
5) Period of Proprioceptive Exercise

3. Algorythm for Evaluation of Ankle Pain after Sprain

1) Acute & Subacute
   Initial Injury 〈 3 mos
   Proper initial management & Rehabilitation 여부 확인

2) Chronic

Initial Injury 〉 6 mos

Causes of Pain

① Instability

② Impingement syndrome

③ Neglected injury

4. Chronic Ankle Instability

1) Cause of ankle instability

① Mechanical insatbility

* pure varus instabiltity

* anterolateral instability

② Functional instability

2) Loss of Joint contact Surface by Instability

1 mm talar shift~40%

2 mm talar shift~50%

3) 증상

Giving-away when walking

Unstableness esp change at direction, turn out, uneven surface

4) Status of Lateral ligaments complex

Laxity of mechanical strength

Loss of Proprioception

5) 진단

Correct physical Examination by Anterior Draw test

10° plantar flexion posture

Actually, Rotational instability

by hinge movement of contralateral Malleolus

Varus stress test or Stress Radiology ?

Modified Romberg test ; functional instability

MRI

6) 치료

Conservative

Operative

5. Treatment of Chronic Ankle Instability

1) Conservative treatment

① Air-cast, Ankle brace, Cast during 6wks

② PSE : Peroneal strengthening exercise during 10wks

③ Physical therapy(Modalities) e.g. Prolo therapy

2) Operative treatment

① Anatomical Reconstruction

Modified Brostrom

Kalsson

② non-Anatomical Reconstruction

Evans

Watson- Johnson

Chrisman-Snook etc..

3) Advantages of Anatomical Reconstruction by Modified Brostrom procedure

① Technically Easy

② Rigid enforcement by "Pants over the Vest" ; inf. extensor retinaculum

③ Reserve Peroneal tendons

④ Control the over-tightness

⑤ Resolve Subtalar instability

6. Ankle Impingement Syndrome

Concept of Universal Joint of Ankle

by Ankle - Subtalar - Chopart joints

1) Antero-lateral Impingement

Lateral gutter syndrome(soft tissue impingement)

Tenderness esp, at anterolateral corner of ankle

Tx by excision of impinged soft tissue & reconstruction

2) Anterior Impingement syndrome

no relation to instability but Aggravated by instability

By passive dorsiflexion of ankle

Bony Impingement btw tibial anterior margin & Talar neck

Tx ; Reconstruction c or s Spur excision

3) Posterior Impingement syndrome

no relation to instability but Aggravated by instability

Nut-Cracker ; Os Trigonum or Trigonal process

Tx ; Reconstruction c or s Trigonal Excision

7. Other Neglected initial injury

Lauge-Hansen classification

inversion injury, 내반-외회전, 내회전 등의 여러가지 손상기전
Combined or associated injury when initial situation

1) Avulsion Fx of Fibular tip(chip fracture)
2) Lateral process fracture of Talus(Shephard fracture)
3) Anterior process fracture of Calcaneous
4) Avulsion Fx of 5th metatarsal base(Jones fracture)
5) Avulsion fragment in Syndesmosis
6) Os subfibulare syndrome; synchondral fracture
7) Os submalleoli syndrome
8) OS Trigonal process fracture
9) High ankle sprain(Syndesmosis Sprain)
10) Subtalar joint sprain; Battle' s sign
11) Peroneal tendon injury
    Peroneous Brevis splitt, or Attrition,
    OS Peroneum syndrome by Peroneous Longus
    Peroneal Retinculum injury (esp SPR)
12) Bifurcate Ligament injury

8. Regional Evaluation to prevent Mis-diagnosis

1) Biomechanical Alignment of Pelvic-limb axis
    Heel varus, valgus / Ttibia vara / Genu varum, valgum
    ex) Heel varus - prone to recurrent ankle sprain
2) Instability
    ① ADT ; mechanical instability
    ② modified Romberg test; functional instability
    ③ Pin-point tenderness; ATFL, CFL
3) Impingement pain due to Instability
    ① 전방충돌증후군; 족배굴곡 유발검사(Plie provocation test)
    ② 후방충돌증후군; 족저굴곡 유발검사(Pointe provocation test)
4) Care for Neglected Initial injury or Fracture
    ① Pin-pointing Tenderness
    ② Battles' sign; Subtalar joint sprain
    ③ West point sqeeze test; Syndesmosis sprain
    ④ Peroneal Provocation Test
    ⑤ Variable direction of Radiological evaluation