Lateral Ankle Instability Surgery: Is a New Standard Emerging?

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Special Thanks:
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I have no conflicts of interest related to this topic.
Agenda

- Establish open Modified-Brostrom as the current “standard” for primary lateral ankle ligament repair
- Review patient populations that need special considerations
- What is an arthroscopic Brostrom and is it poised to become the new “standard”?
- What is the influence of cost on our decision to adopt arthroscopic Brostrom?
Live Poll Question #1

• My technique of choice for primary lateral ankle ligament repair in an uncomplicated case is:
  1. Open Modified Brostrom (no arthroscopy)
  2. Ankle Arthroscopy followed by open Modified Brostrom
  3. Arthroscopic Brostrom
  4. Other
Live Poll Question #2

- When I perform lateral ankle ligament primary repairs, I utilize soft tissue anchors......
  1. commonly, 75-100% of the time.
  2. sometimes, 25 – 75% of the time.
  3. rarely, up to 25 % of the time.
  4. Never.
Chronic Lateral Ankle Instability

- Ankle sprains are the most common lower extremity injury.
- Up to 55% will never seek evaluation (McKay et al Br JBJS 2001)
- Despite appropriate non-surgical treatment, up to 20% of ankle sprain patients have persistent pain/instability complaints.
- Open surgical repair has proven to be effective and safe.
Evolution of Lateral Ankle Ligament Repair

• Gould *Foot Ankle* 1980
• Karlsson *JBJS* 1988
• Not much has changed since and open modified Brostrom (MB). It reigns as the “gold” standard.

Evolution of Lateral Ankle Ligament Repair

- Guelfi F&A Sx, 2018
  - 13 studies, 505 pts
  - 6.1 year avg f/u
  - AOFAS 90.1 avg, 2 studies with Karlsson scope 95, 88.2
  - G&E 91.7%
  - Buerer et al. RTSport 4.7 mo
  - Schmidt RTW 38.5 days
  - 7.92% compl (supr wound 2%, sensory disturbances 2%, swelling >6 mo 1.4%, rerupture 1%)

- So JFAS 2017
  - 11 studies, 669 pts
  - 8.4 year avg f/u
  - 1.2% revision rate
    - Overconstraint #1 reason
  - 5.6% complication rate
    - 42% nerve related
Special Considerations

- Ligamentous Laxity
- Hindfoot Varus / Cavus
- High BMI
- High Demand Athlete
- Fibular Ossicles
- Revision Surgery
- Subtalar instability
Ligamentous Laxity Score

Ligamentous Laxity Score

- Park et al, AJSM, 2016
- Generalized Ligamentous Laxity is an Independent Risk Factor of Poor Outcomes after MB

Beighton P, Ann Rheum Dis, 1973
Subtalar Joint Instability

- 80% of patients with chronic ankle instability (Denegar et al, Med Sci, 1999)
- Make STJ stability exam part of your routine
- Ehlers Danlos patients beware
- ALWAYS manually inspect the CFL (MRI can miss tears)
Varus / Cavus
Subfibular Ossicles
Elite/High-Demand Athlete

- Guillo 2013 #16, 8
  - “Severe sprain acute repair of lateral ligaments in elite athletes reduces risk of developing chronic lateral ankle ligament instability”
- Takao AJSM 2012
- Li AJSM 2009
Revisions
Indications for Modified Brostrom

- Recurrent post-injury lateral ankle instability after failed non-operative treatment for 6 mo.
  - immobilization
  - Physical therapy
  - Bracing
- Inability to resume pre-injury activities for greater than 6 mo
Modified Brostrom Procedural Pearls

- Positioning
- Incision
- Peroneal and CFL inspection
- Avoid over-tensioning
- Tie locking knots

Pic courtesy: Edwards B, Development of Anatomic Brostrom
Modified Brostrom Procedural Pearls
Arthroscopy’s Role in Lateral Ligament Repair Surgery

• Should we Pre-Scope all Modified Brostroms?
  – Choi AJSM 2008 (97%)
  – Ferkel FAI 2007 (95%)
  – Ferkel FAI 1999 (93%)
  – Hua JARS 2010 (91%)
  – Yeo FAI 2016 (68%)
  – Hintermann 2002 (66%)
Can we then make the leap to all-arthroscopic MB?

- Yeo et al, FAI, 2016 says **YES**
- Roger Mann Award Winner
- Level I study
- 1 year f/u
- All-inside scope repair vs anchor-less open MB
- AOFAS, Karlsson/VAS/stress radiographs

- All patients had arthroscopic exam
- Clinical and radiographic outcomes were equal between both groups and in line with established high standards
Hua et al commentary of scope vs open Aug 2018

- Great summary of where we are right now with scope repairs in the research.
- He admits that current research shows an unacceptably high overall complication rate of 11.5%
- Declares that procedural modifications are necessary to reduce complications

- Scope suture “safe zone” Acevedo AJSM 2015
- His 2017 comparison of 37 Open vs 23 arthroscopic repairs at 2 years f/u showed:
  - No instability recurrences / revisions
  - No wound infection
  - No numbness complications
  - Outcome scores as good as open
Can we make the leap to all-arthroscopic MB?

- Post-Op AOFAS
  - Hua 2017 AJSM 93.3 @ 3.5 years
  - Cottom 2013 FFAS 95 @ 1 year
  - Nery 2011 AJSM 90 @ 9.8 years
  - Kim 2011 Orthopedics 92.5 @ 1.3 years
Matteo et al, 2018, F&A Sx, scope vs open, systematic review

- 19 studies (13 open, 6 scope)
  - Open
    - 13 studies, 505 pts
    - 73.4 mo avg f/u
    - AOFAS 90.1 avg, 2 studies with Karlsson scope 95, 88.2
    - G&E 91.7%
    - Buerer et all RTSport 4.7 mo
    - Schmidt RTW 38.5 days
    - 7.92% compl (supr wound 2%, sensory disturbances 2%, swelling >6 mo 1.4%, rerupture 1%)
  - Scope
    - 6 studies, 216 pts
    - 37.4 mo avg f/u
    - AOFAS 92.48, 1 Karlsson 90.2
    - No RTSport or RTW data
    - 15.27% complication rate (4% neuritis of SPN, delayed wound healing 3.7%, persistnet pain 1.4%, prominent knots 1.4%, supr infx 1%, dvt 1%)
Can we make the leap to all-arthroscopic MB?

**Comparison of Mid-term Outcomes Between an Arthroscopic and an Open Modified Broström Procedure for Ankle Instability**

Young Koo Lee, MD, PhD, SungBum Park, MD, SangWoo Lee, MD

**Category:** Arthroscopy

**Keywords:** Chronic lateral ankle instability, arthroscopy, Broström procedure

**Comparison of the period of return to practice in All-Inside Arthroscopic and Open Techniques for the Modified Broström Procedure for Ankle Instability**

Young Koo Lee, MD, PhD, Sun Geun Lee, MD

**Category:** Arthroscopy

**Keywords:** lateral ankle instability; arthroscopic Modified Broström operation; Open Modified Broström operation
What exactly IS an arthroscopic Brostrom?

- Scope “assisted” mini-open
- ATFL re-attachment
- All-inside ATFL plication
What’s The Score?

• **Pro-Open**
  – It’s the standard, high bar
  – Never miss CFL pathology
  – Minimize STJ instability failures by always getting a good quality Gould
  – Peroneal tendon inspection
  – Lower complications
  – Cheaper

• **Pro-Scope**
  – More efficient
  – Reduced post op pain?
  – Scope ensures intra-articular lesions not missed
  – Better cosmesis, less wound complication?
  – Faster return to sport/work?
Can’t deny the inevitable: “arthroscopy IS the future”....Can we?

- Less invasive? - yep
- Quicker recovery? - maybe
  • Petrera 2014 AJSM immediate WB with 2 anchors
- Lower complications? -not yet
- Just as strong? – Yep
  • Giza 2013
  • Lee 2016
- Just as effective? – yep
- More efficient? – I think YES
Modified Brostrom with 2 anchors vs with suture-bridge in high demand athletes

- Both did very well
  - AOFAS 92.1 vs 90.8
  - FAOS 90.6 vs 90.1
  - Karlsson score 90.5 vs 91.6
  - Satis Sefton score 91.7 vs 90.5%
  - Equal func scores
  - Telos device no diff

- Adding the 2 anchors increased cost 1.85 times

Cho et al, FAI 2015
Live Poll Question #3

• In 10 years, I think that the majority of primary lateral ankle ligament repairs will be done arthroscopically:
1. True
2. False
Take Home Points

• 2018 Standards for primary lateral ankle ligament repair
  – Open Brostrom primary cases
  – Pre-scope
  – Avoid in pts with high Beighton score
  – Acceptable revision rate < 2%
  – Expected complication rate 5-7%
Take Home Points

• All arthroscopic MB definitely has a promising future
  – Very effective
  – High patient satisfaction
  – Minimally invasive
  – Efficient
  – Complication rates are falling as the techniques evolve

Pic: Vega et al, FAI, 2013
Thanks!
Citations

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