“DOCTOR, MY SHOULDER KEEPS POPPING OUT!”

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INTRODUCTION

• Papyras reported shoulder dislocation 3000-2500BC.
• Kocher technique 1200BC.
• Hippocrates reported a reduction technique for the dislocated shoulder 460BC.
• Since 1900’s non anatomical procedures were introduced (bone grafting of the glenoid, tendon transferes).
• High incidence of recurrence.
• Biomechanical studies and arthroscopy have refocused our understanding of shoulder instability.
SHOULDER INSTABILITY:

• Anatomy/Biomechanics.
  • Passive stabilisers.
  • Active stabilisers.
• Classification of shoulder instability.
• Process of classification.
• Principals of treatment.
  • Surgical.
  • Non surgical.
DEFINITIONS

• Joint Laxity:
  – Physiological motion of the GHJ that allows a full range of movement, which is asymptomatic.

• Joint Instability:
  – Abnormal symptomatic motion of the GHJ that results in pain, subluxation or dislocation.

• Hypermobility Syndrome:
  – Patients with generalised joint laxity who present with musculoskeletal complaints (4.2-4.6%). Males>Females?
  – Emery et al 1991
    • 75% pre-adolescents asymptomatic shoulder laxity.
    • Males=Females
  – No evidence that general joint laxity is a risk factor for instability:
CLASSIFICATION OF SHOULDER INSTABILITY

• AIMS:
  – HELP TREATMENT
  – PROVIDE A PROGNOSIS

• TERMINOLOGY FOR INSTABILITY:
  – DEGREE OF DISLOCATION.
  – CHRONICITY OF INSTABILITY.
  – VOLITION OF INSTABILITY.
  – DIRECTION OF INSTABILITY.
DEGREE OF INSTABILITY

• DISLOCATION:
  – Complete separation of the glenohumeral surfaces.

• SUBLUXATION:
  – Symptomatic separation of the joint surfaces without dislocation.
  – Recurrent subluxation may coexist with dislocation (Hill Sachs lesion seen in 47% of pts).
CHRONICITY OF INSTABILITY

• ACUTE INSTABILITY:
  – Instability from an acute episode, which is diagnosed within a day of the event.
  – Recurrent instability is when these episodes occur more than once.

• CHRONIC/CONGENITAL INSTABILITY:
  – Very rare
  – Bone deformities eg; malunited fractures or dysplasia.
VOLITION OF INSTABILITY

• Involuntary instability:
  – The humeral head is unstable without a muscle patterning problem.

• Voluntary instability:
  – The humeral head is unstable with a deliberate muscle patterning problem.

• Habitual instability:
  – Shoulder instability caused by an unbalanced muscle action, which is voluntary and deeply ingrained. Used synonymous with voluntary.
  – Important to distinguish between deliberate voluntary movement and displacement that occurs at certain movements ie involuntary.
  – Psychiatric conditions account for 30% of habitual instability (Rowe 73)
  – No difference in psychological profiles between atraumatic/traumatic and age matched controls (unpublished Fisher K Bayley I)

• Involuntary positional instability:(Takwale and Calvert 00).
• N=50 only 1 patient had mild psychiatric condition.
• Therefore the pathological factor is the abnormal muscle patterning not the psychological profile
DIRECTION OF INSTABILITY

• UNIDIRECTIONAL:
  – Bankart lesion (1948) traditionally the most common pattern of instability.

• MULTIDIRECTIONAL:
  – Neer (1980) introduced the concept of Multidirectional instability.
  – Unidirectional anterior instability and MDI have different surgical management strategies.
  – Inferior capsular shift must be addressed with MDI (Neer 80)
  – Overtightening the capsule can lead to instability in the opposite direction and OA.
  – Surgery for MDI is not the entire solution.
DIRECTION OF INSTABILITY

• Pathology of Multidirectional instability:
  – Redundant capsule.
  – Lax Ligaments.
  – Weakened or abnormal Musculoskeletal system.

• Most pts do have global instability
• A proportion of patients have a primary direction of instability with the addition of an inferior component, (Calvert 96).
• True anterior instability may be an over simplification as some of these patients have anteroinferior instability.
• MDI may be a bi-directional instability combining anteroinferior with posteroinferior instability.
• Therefore is MDI under diagnosed?
AETIOLOGY OF INSTABILITY

- Traumatic and atraumatic.
- Rowe 1963
  - 96% traumatic 4% atraumatic
- Traumatic anterior instability with a clear Hx makes the treatment decision clear cut.
- Problems:
  - No clear Hx of trauma
  - Pts with Lax joints and with a trivial Hx of trauma.
  - Need to correctly classify in order to correctly treat.
CLASSIFICATION PROCESS

• Thomas and Matsen classification (1989)
• Based on traumatic aetiology and easy to remember.
• TUBS:
  – (Traumatic Unidirectional Bankart lesion treated with Surgery).
• AMBRI:
  – (Atraumatic Multidirectional Bilateral treated with rehabilitation and if surgery is required an Inferior capsular shift)
  – Problems:
    • Acronyms only represent the extremes of presentation spectrum.
    • Does not classify all the instability patients.
    • One cannot treat instability on this classification.
**Classification process**

**Bayley classification**

N=223

- Traumatic
  - Good result: 43
  - Cases operated: 2/9
  - Reducing Muscle Patterning: 21
- Atraumatic
  - Group I
  - Pathologies: Trauma (yes), Articular surface damage (yes), Capsular problem (yes, Bankart lesion), Uni/bilateral (uni/bilateral), Muscle patterning (normal)
  - Group II
  - Pathologies: Trauma (no), Articular surface damage (yes), Capsular problem (yes, Dysfunctional), Uni/bilateral (uni/bilateral), Muscle patterning (normal)
  - Group III
  - Pathologies: Trauma (no), Articular surface damage (no), Capsular problem (no, Dysfunctional), Uni/bilateral (often bilateral), Muscle patterning (abnormal)
CLINICAL SYMPTOMS

• Hx of trauma, (position of arm at injury).
• Dead arm syndrome.
• Age.
  – Elderly suspect rotator cuff rupture
  – Young pt with impingment (subluxing)?
    • If treat impingment 10% good result.
    • If treat subluxation 90% good result. (Calvert 96).
      – After single dislocation:
        – <20yrs 80-92% recurrence<2yrs. (10-20% surgery).
        – >40yrs 10-15% recurrence<2yrs.
• Previous treatment.
CLINICAL EXAMINATION

• General examination:
  – General joint laxity.
  – Posture.

• Specific examination:
  – Shoulder Laxity.
    • Anterior/posterior draw test.
    • Sulcus sign/Jerk test.
  – Shoulder Instability.
    • Apprehension test
      – Fulcrum test.
    • Relocation test
INVESTIGATIONS
RADIOLOGY

- Plain X-rays (AP, LAT, Stryker).
- Arthrography.
- CT-scan.
  - Bone architecture.
  - CT-arthography (labral defects).
- MRI-scan(arthrography).
  - Most sensitive for labral defects and articular lesions
  - Sens=88% Spec=93% (Iamotti 91)
  - Sens=76% Spec=98% (Palmer 95)
INVESTIGATIONS
ARTHROSCOPY

• Static and dynamic process in the GHJ.
• Articular architecture.
• Broca defect
  – 80% pts with instability on arthroscopy, (compared to 47% on x-ray).
• Drive through sign (Pagnani 93)
  – (n=234) Sen=92% Spec=37.6% PPV=29.9%
  – Non specific for instability but good association with laxity.
• Mok 90
  – (n=166) classified pts into traumatic and atraumatic
  – Arthroscopy changed the management in 48% of cases.
• Pts with recurrent instability following surgery
• Pts with complicated atraumatic instability
SHOULDER INSTABILITY
TREATMENT

PRINCIPALS OF TREATMENT:

Operative

Non-operative

Traumatic Instability

Atraumatic Instability

Muscle Patterning

Cuff strengthening.

Muscle re-education

- Scapular/thoracic exercise Programme.
- Concentric/Eccentric exercises.
- Change life style

- Tapping
- Biofeedback
- Counselling to avoid intentional subluxation.
- Psychological evaluation.

Structural problem

Operative reconstruction
SHOULDER INSTABILITY
TREATMENT

• INDICATIONS FOR SURGERY:
  – In traumatic instability with obvious Hx trauma.
  – In MDI and post instability only after an intensive exercise programme and a structural problem has been identified.
  – In atraumatic pts with a structural problem, early surgery is controversial.
    • Kiss 2001:
      – 84 pts MDI FU 3.7yrs
      – 62 pts rehabilitation early 6% surgery
      – 22 pts surgery early 32% further surgery

• CONTRAINDICATIONS FOR SURGERY:
  – Muscle patterning problems
  – Psychiatric/emotional instability
SHOULDER INSTABILITY
TREATMENT

• NON-OPERATIVE TREATMENT:
  – Muscle strengthening programme:
    • Pts with atraumatic/traumatic instability BUT no muscle patterning disorder.
  – Muscle re-education programme:
    • Pts with atraumatic/traumatic instability WITH a muscle patterning disorder.
• Rockwood 85 (74 shoulders traumatic/atraumatic instability FU 4yrs).
  – 16% success-traumatic instability.
    • Traumatic posterior instability had a better response to rehabilitation than anterior instability.
  – 80% success-atraumatic instability.
SHOULDER INSTABILITY

CONCLUSION

• Classification of a patient with instability is the crucial step in the management process.
• Accurate classification only comes about from a detailed Hx, Ex and appropriate investigations.
• At present there is no universally recognised classification, which covers all the areas of instability. Until then the treatment guide lines will remain inadequate.
• Our understanding of the biomechanics of shoulder instability is an ever-evolving science.
• Successful surgery will only occur if the anatomy is addressed at the operation and the patients are carefully selected.
SHOULDER INSTABILITY

ANY?