Hypothesis

The pathologic entity of recalcitrant tennis elbow (lateral epicondylitis of the elbow: LEC) would be the impingement syndrome of the lateral elbow related to the radial head abutment during supino-pronation like as the impingement syndrome of the shoulder.

Methods

- 71 elbows in 68 recalcitrant LEC patients (26 males and 42 females) who underwent mini-open modified Boyd's procedure were evaluated clinically, ultrasonographically, MRI findings, and histologically.
- Average follow-up period was 14.2 months.

Surgical technique

- 2-3 cm skin incision without decortication and drilling.
- Not only a resection of the degenerative tissue at the ECRB origin, but also sufficient resection of the capsule and a part of the annular ligament are important during the surgery.

Results

Ultrasonographic analysis

Elasticity in the ECRB origin
- 2 groups: Control, Disease (operative treatment).
- The strain ratio (fat-lesion-ratio) in the ECRB origin was defined as the elasticity in this lesion using the Real-time Tissue Elastography.

Lateral shift of the radial head
- 3 groups: Control, Mild LEC (non-operative treatment), Severe LEC (operative treatment).
- The lateral shift of the radial head was defined as the migration length of the radial head over the tangential line of the radiohumeral joint accompanied by the forearm rotation.

Clinical evaluations

- Grip: 18.4Kg (61.3%) → 29.4Kg (98.0%)
- JOA-JES score: 33.9 → 92.2

Decrease of the ECRB elasticity
The disease group (operative treatment) showed the decrease of the elasticity in the ECRB origin than the control group.

Poor radial head mobility
The severe LEC group (operative treatment) had poorer radial head mobility than the mild LEC group (non-operative treatment).

MRI and histological evaluations

MRI signal changes = Histological characters
- MRI high focus + (H group) → Angiofibroblastic hyperplasia
- MRI high focus - (L group) → Fibrosis

MRI signal changes x Duration of the symptoms
- Degree of the MRI signal changes and histological character were correlated but the histological changes (e.g. fibrosis or angiogenesis) were randomize.

Summary points

Lateral elbow impingement syndrome (LEIS)
Recalcitrant LEC has a progress cycle (micro tear → angiogenesis → remodeling → fibrosis). As this cycle progresses, the decrease of the elasticity in the ECRB origin and the inhibition of the normal radial head motion would occur like as the impingement syndrome of the shoulder.

Peri radial-head decompression (PRD)
Thus, the key-point of the surgical concept for the recalcitrant tennis elbow is not only the debridement of the degenerative tissue at the ECRB origin but also the decompression of the peri radial head at the lateral elbow.