Tackling painful knee in sportsman – the Challenges!

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SPORTS INJURY in HK (1996-2005)

- Sports Injury 21.5%
- Traffic accident 17.7%
- Home/Leisure 44%
- Violence 6.9%

Details of sports involved

<table>
<thead>
<tr>
<th>Ball games</th>
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</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>37</td>
</tr>
<tr>
<td>Soccer</td>
<td>28</td>
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<tr>
<td>Volleyball</td>
<td>12</td>
</tr>
<tr>
<td>Badminton</td>
<td>9</td>
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<tr>
<td>Handball</td>
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<tr>
<td>Table tennis</td>
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<tr>
<td>Rugby</td>
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<tr>
<td>Softball</td>
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<tr>
<td>Track and field</td>
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<tr>
<td>Sprinting</td>
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<tr>
<td>Middle and long distance running</td>
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<tr>
<td>Long jump</td>
<td>8</td>
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<tr>
<td>High jump</td>
<td>5</td>
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<tr>
<td>Other specialties</td>
<td>18</td>
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<tr>
<td>Water sports</td>
<td></td>
</tr>
<tr>
<td>Swimming</td>
<td>7</td>
</tr>
<tr>
<td>Rowing</td>
<td>1</td>
</tr>
<tr>
<td>Martial judo</td>
<td>2</td>
</tr>
<tr>
<td>Judo</td>
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<tr>
<td>Karate</td>
<td></td>
</tr>
<tr>
<td>Cycling</td>
<td>28</td>
</tr>
<tr>
<td>Ballet dancing</td>
<td>10</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>8</td>
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<tr>
<td>Trampolining</td>
<td>3</td>
</tr>
<tr>
<td>Weight training</td>
<td>2</td>
</tr>
<tr>
<td>Roller skating</td>
<td>3</td>
</tr>
<tr>
<td>Others (horse riding, bowling, climbing, etc.)</td>
<td>17</td>
</tr>
</tbody>
</table>
Sports Clinic Registry in PWH (2009)

- Knee (56%)
- Foot & Ankle (15%)
- Hip, Thigh & Calf (12%)
- Shoulder (10%)
- Hand/Wrist/Elbow (5%)
- Back (4%)

Risk of sports injuries
KNEE PAIN:  
ACUTE INJURIES  
Vs  
OVERUSE INJURIES

Acute Injuries
Torn Anteriro Cruciate Ligament (ACL) - Warning Features

- Intensive pain
- Progressive increase swelling
- Significant Decreased ROM
- Feel a “Pop”
- “Dead” leg
- Cannot continue to play

MENICUS INJURY
Symptoms of Meniscal tear

- **Symptoms**
  - Pain
  - Locking
  - Knee swelling

- **Signs**
  - Knee effusion
  - Joint line tenderness
  - Apley grinding test
  - McMurray test
Meniscal injury

- Common, may associate with ligament injury
- **Conservative Vs Operative**
- **Operative indications**
  - Lock knee
  - Associate cruciate injury
  - Fail conservative treatment
- **Surgical treatment**
  - Meniscus repair
  - Partial menisectomy

CARTILAGE INJURIES

- Acute Cartilage injuries commonly presented with:
  - Pain
  - Effusion
  - ± Locking
  - Decrease ROM
Acute Knee Injuries presented with Pain – Not Difficult to identify the cause & manage if detected early

KNEE Overuse Injuries IN SPORTS
Overuse Injuries

- Injury rate increases with the frequency, intensity, mode and duration of training.

- Many other factors contributing to getting hurt during training:
  - pre-existing anatomical abnormalities
  - medical problems
  - training program & technique
  - distribution of training and rest
  - how your body adapts to wear & tear.
Combination of factors

Motion & Load

Technique

Equipment

Intrinsic

TISSUES PRONE TO OVERUSE INJURIES AROUND THE KNEE

- Bone
- Cartilage
- Ligament
- Muscles
- Tendons
After injury, what to do next?

- “RICE” or “PRICE”.
- Treat the symptoms.
- Heal the tissue
- PREVENTION OF RECURRENCE:
  - Identifying the cause of the injuries (like limbs malalignment, muscle weakness, soft tissue tightness, wrong pair of shoes….)
- Rehabilitation:
  - “Train through” injury (with a bit of slowing down the intensity) or having a complete rest?
  - Certain extent of “Cross training” (like swimming, cycling…) will probably a good compromise

Warning Features to alert when taking care Athletes with Knee pain:

- **Intensive pain**
- **Deteriorating symptoms**
- **Cannot train**
- **Risk factors identified**
- **Previous history**
Knee Pain in Sportsman

- Anterior Knee Pain
- Lateral Knee Pain
- Posterior Knee Pain

Anterior Knee Pain
“Patellofemoral pain syndrome”

- “Runner’s Knee”
- “Chondromalacia patella”
- Patella tracking is not on the right way
Symptoms:

- Pain in front of the knee.
- Onset usually gradual
- Particularly during running up/down hill or stairs.
- Crepitations
- Anatomical abnormalities

Causes - Usually a biomechanical problem

- **Patella malalignment** brought on by various anatomical abnormality, deficits in strength/ flexibility
  - Excessive femoral anteversion
  - Patella alta
  - Shallow trochlear groove
  - Weak vasta medialis muscle
  - Tight lateral retinaculum of the knee
  - Increasing Q angle or valgus knee
  - Tight hamstring and calf muscle
  - Over-pronated feet.
- **“Miserable Malalignment syndrome”** for runners:
  - Internally rotated hip
  - Knock-knee
  - Flat feet.
Treatment

- Tackle the underlying cause of the patella mal-tracking:
  - orthotics
  - strengthening of weak muscle
  - stretching of tight structures
- Cross training methods (Brisk walking and swimming exercise)
- < 10% of cases: Operative treatment
  - Knee arthroscopy
  - Realignment surgery

Patellar Tendinosis
Patellar Tendinosis

- Jumper’s Knee
- Anterior Knee Pain associated with tenderness at the inferior pole of patella

Tendinosis

Ultrasound and MRI are the two imaging modalities

- Confirms diagnosis
- Excludes other conditions
- Severity
- ?? Prognosis
- Surgical intervention
Non-operative treatment

- Progressive closed chained quadriceps training.
- Eccentric Muscle Strengthening
- Avoid jumping sport on hard surface
- Stretching of tight muscle group
- Local physical therapy
- ?? Bracing/Strappings
- NSAID, ? Corticosteriods injection

Extracorporeal Shock Wave Therapy (ESWT)
**Usefulness of NSAID**

- More evidence in supporting its usage in Rheumatological disease, **BUT NOT FOR PATELLA TENDINOSIS.**
- Can suppress pain, but taken as a risk to remove the “fire alarm” of pain and place the athlete in great jeopardy with respect to tissue overload and failure.
- Regarded as a “too passive” and dependant modality and does not challenge the athlete’s responsibility of properly train, condition, and develop correct technique.

**Usefulness of Corticosteroid**

- Only strong support found in the treatment of **trigger finger**
- Beware of possible complications:
  - Tendon atrophy or rupture
  - Infection
  - Fat atrophy
  - Hyperglycaemia & adrenal axis compression (rare)

**NO EVIDENCE TO GUIDE TREATMENT**
**NSAID & Corticosteroid**

?? Inducing Tendinosis

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**Surgical Treatment**

- Methods:
  - *Excision*, Drilling, Decompression
Results from Literatures

- Satisfactory results
  - Colosimo *Orthopaedic Reviews* 1990
- However, absence of Randomised studies, no conclusive evidence can be drawn from the literature regarding the effectiveness of surgical treatment

Lateral knee Pain
- Iliotibial Band (ITB) syndrome

- ITB rub against the lateral epicondyle of distal femur, causing inflammation of the underlying bursa, and thus resulted in Iliotibial band syndrome.
Iliotibial Band Syndrome

- The onset of symptom is gradual
- Tightness felt over the lateral aspect of the distal thigh and knee.
- Increasing pain on running, worse with running downhill or downstairs activities.
- The discomfort subsided with stop running.
- In worse condition, the pain will force the athlete to walk with the injured leg fully extended to relieve the friction of the ITB over the lateral epicondyle of the knee.

Causes:

1. Repetitive flexion and extension of the knee like in marathon training
2. Running slanted or downhill surface
3. Not warm up or cool down properly during training, causing tightness and decrease flexibility of the iliotibial band.
4. Anatomical abnormalities:
   1. Weakness in hip abductors
   2. Bow legs
Treatment:

- **Reduce training intensities** and put ice on the painful sites.
- Taking **NSAID** will help to relieve the acute symptoms.
- **Cautions should be taken in Cross training** as activities like cycling or rowing also cause irritations to the ITB over the lateral aspect of the knee.

Treatment

1. Evaluating on the shoes
2. Biomechanical evaluation of the running pattern
3. Physiotherapist:
   - Relief pain over the trigger point
   - Stretching the tight lateral structures
   - Specific strengthening exercise for the weak muscle
4. ?? Injection of Corticol Steroid
5. Surgery is extremely rare in need.
REGENERATION: Autologous Chondrocyte Implantation

Cartilage biopsy and culture

Chondrocyte implantation under periosteum

1. Flat feet
2. Valgus Knee both side
3. Weak Vasta Medialis
4. Bilateral Patella maltracking
5. Crepitations both PFJ
6. Pain over right knee PFJ
- Degenerative changes over PFJ
- Cartilage defect over lateral facet, femoral trochlear

Operation: Arthroscopic Chondral-plasty + Lateral Release
Why Overuse Injury always recur?
TOO SOON..... TOO EARLY

DOC, WHEN CAN HE PLAY?

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Criteria for return to sports

- Absence of Pain & tenderness
- Muscle Function within 10% of normal at both slow & fast speeds on Isokinetic testing
- Restoration of flexibility & endurance
- Intact proprioceptive sense
- Sports-specific functional evaluation
Preventing Overuse Knee Injuries

- Recognise & Correct Poor technique / posture
- Proper Training Program under coaches guidance
- Check fit & appropriateness of equipment
- Warm up & stretch before & after sport
- Gradually increase intensity & duration of practice
- Avoid playing when very tired or in pain
- Do Not Use Steroids

REHABILITATION
- Start as early as possible
The Key to KNEE INJURY PREVENTION is STRENGTH and FLEXIBILITY

CONCLUSIONS:

- Pain around the knee is very common during training for an athlete, the correct attitude is to face it and tackle it with knowledge wisely once they’ve occurred.

- I always guide my patients to think of this in two distinct ways:
  - Healing the actual trauma so one can return to play without pain.
  - Determining the underlying causes of the injury so as to prevent recurrence.
PLAY SMART
&
PLAY SAFE

www.hkasmss.org.hk
Facebook Group

Hong Kong Association of Sports Medicine and Sports Science

Basic Info
Type: Organizations - Academic Organizations
Description: This group is the best and managed by Hong Kong Association of Sports Medicine and Sports Science to share news to local colleagues, friends and students. If you are working in or interested in sports medicine and sports science, please join! Thanks!

If you like further join as a member to HKASMS, please go to our website (http://www.hkasms.org.hk) and fill in the membership application form (http://www.hkasms.org.hk/membership@kclt.org.hk). Thanks!

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Recent News
We have celebrated the 20th anniversary and organized the 2nd Student Conference on Sports Medicine, Rehabilitation and Exercise Science on November 1, 2008. Please check the details at http://www.hkasms.org.hk/2008conference.

Post-conference report and photos are posted on the web. Please go and view, and feel free to save the full-sized photos!

Congratulations to Miss Bos-Tin Tang, Miss Erica YY Lau, Dr Yullan Hoong, Miss Polly Chung and Mr Mathew Lam for winning the Best Paper Award!

Thank You!