Total Joint Replacement in Octogenarians
Dilemma & Challenges

Dr NG FU YUEN
Associate Consultant
Department of Orthopaedics and Traumatology
Queen Mary Hospital
Aging Population in Hong Kong

Life Expectancy
Female 86
Male 81

Figure from Census and Statistics Department, HKSAR
Future Population in Hong Kong

Figure from The Budget 2013-2014, HKSAR
Total Knee Replacement in Octogenarians in HA Hospitals

- How large is the problem?

Data from CDARS 1999 - 2014
Dilemma

- How old is “too old for surgery”?
- How ill is “too ill for surgery”?
Indications of Total Knee Replacement

- Advanced osteoarthritis of knees
- Failed conservative treatments
- No active infection
- Age is not a contra-indication!!

Aim of Surgery
- Pain free
- Mobile
- Stable knee joint
Characteristics of Octogenarians

- Complexity of medical problems
  - Hypertension
  - Diabetes mellitus
  - Hyperlipidaemia
  - Osteoporosis
  - Benign prostatic hypertrophy
  - Ischaemic heart disease
  - Stroke
  - Dementia
- Social problems
  - Living environment
  - Carer
Problems of TKR in Octogenarians

- Higher mortality rate
- Higher complication rate
- Slower in rehabilitation
- Longer length of stay

Perioperative Mortality

- 30-day mortality
  - <80 0.1%
  - 80-89 0.4%
  - 90+ 1.4%

- Causes of mortality
  - Cardiovascular
  - Pulmonary embolism

*Mirc A et al. J Arthroplasty 2014*
Thromboembolism after TKR

- Incidence of pulmonary embolism after TKR
  - 0.4%

- Preventive measures:
  - Early mobilisation
  - Pharmacological prophylaxis
  - Mechanical prophylaxis

- Routine doppler USG after TKR not recommended by national guideline

- Early detection by clinical symptoms, signs & confirmed with imagings
Prevention of VTE
Pharmacological Prophylaxis

- Options of drugs
  - Aspirin
  - Warfarin
  - Unfractionated heparin
  - Low molecular weight heparin
  - Factor Xa inhibitor
  - Direct thrombin inhibitor

- Cons
  - Risk of bleeding
Prevention of VTE
Mechanical Prophylaxis

• Pros
  • No significant risk related to the mechanical prophylaxis

• Cons
  • Not as effective as pharmacological agents
  • Cost
Complications of TKR

- Wound infection
- Nerve injury
- Vascular injury
- Fracture
- Extensor mechanism disruption
- Patella mal-tracking
- Loosening & wear
Surgical Site Infection

- Incidence of SSI after TKR
  - 1%
- Risk Factors:
  - Rheumatoid arthritis
  - Diabetes Mellitus
  - Prior surgery
  - Revision total joint replacement
Surgical Site Infection

- Measures to reduce SSI:
  - Prophylactic antibiotics
    - Broad spectrum covering Gram + organisms
    - MRSA carrier – selective use of Vancomycin
  - Laminar air flow operating theatre
  - Exhaust body system
    - Contradictory results
- Additive measures:
  - Antibiotics cement
  - Use of transexamic acid (TXA)
The Surveillance of Surgical Site Infection after Primary Total Knee Replacement from 1993 to 2013

Division of Joint Replacement Surgery
FY NG, KY CHIU, CH YAN, PK CHAN
## Risk Factors in Primary TKR

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Risk Ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;70</td>
<td>1</td>
<td>0.48</td>
</tr>
<tr>
<td>&gt;70</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>0.03</td>
</tr>
<tr>
<td>Male</td>
<td>2.59</td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes Mellitus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>0.05</td>
</tr>
<tr>
<td>Yes</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td><strong>Rheumatoid Arthritis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>0.01</td>
</tr>
<tr>
<td>Yes</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td><strong>Previous Surgery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>0.22</td>
</tr>
<tr>
<td>Yes</td>
<td>2.59</td>
<td></td>
</tr>
<tr>
<td><strong>One Stage Bilateral TKR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>0.59</td>
</tr>
<tr>
<td>No</td>
<td>1.25</td>
<td></td>
</tr>
</tbody>
</table>
Emerging evidence of MRSA carriers in Hong Kong

- 2005: 2.8 - 5.1% MRSA carriers in long term care facilities
- 2011: increased to 21.6%

VCC Cheng et al. Transmission of MRSA in the long term care facilities in Hong Kong. BMC Infectious Diseases 2013
Emerging evidence of infection control

- Pre-operative MRSA screening
  - MRSA carriers prevalent in institutionalised patients
  - Decolonisation protocol
  - Vancomycin as prophylactic antibiotics in selected cases

- Antibiotics cement in high risk patients
  - Rheumatoid arthritis
  - Revision total joint replacement
  - Immunosuppressive agents
Transexamic Acid in TKR

- Either given intravenously or intra-articularly

- Significantly reduce postoperative bleeding and drain output

- Significantly reduce post-operative transfusion

- Potentially reduce wound haematoma and infection
Slower Rehabilitation

- Muscle power improvement
- Proprioception training
- ↑Length of stay

Postoperative Pain Control

- Conventional pain control
  - Oral opioid
  - Intramuscular/ intravenous opioid

- Contemporary pain control
  - Avoid use of opioid
  - Multimodal approach
  - Pre-emptive analgesics
  - Intra-articular cocktail injection
  - Peripheral nerve block
Pre-emptive analgesics

- **Principles:**
  - Introduction of an analgesic regimen before the onset of noxious stimuli, with the goal of preventing sensitization of the nervous system to subsequent stimuli that could amplify pain.

- **Agents:**
  - Cox-II agents
  - Neuropathic agents
Cocktail (Periarticular) Injection
• Efficacy of cocktail injection similar to continuous femoral nerve block
• Technically more simple for cocktail injection
• Cost is lower in cocktail injection

FY Ng et al. J Arthroplasty 2012
Fast-track Rehabilitation after TKR

- Structured protocol
- Multidisciplinary approach
- Effective pain control
- Efficient surgical team
- Early rehabilitation

F/ 86 Four hour after Left TKR
Team Work
Conclusion

- TKR is a viable option for advanced OA knees in octogenarian
- With careful selection of patients, TKR can be safely performed
- Perioperative pain control is essential for early rehabilitation
- Fast track rehabilitation is possible in selected patients
A Book – Being Mortal
Thank You