Enhanced recovery programme after TKA through multi-disciplinary collaboration

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Introduction

- Osteoarthritis of Knee (OAK) is the leading cause of chronic disability

- Total knee arthroplasty (TKA) is cost effective
  - Pain relief
  - Quality of life

WHO Global Burden of Disease 2010
Elena Losina et al, Cost-effectiveness of Total Knee Arthroplasty in the United States, Arch Intern Med. Author manuscript; available in PMC Dec 22, 2009
Aging population in HK

Population Pyramids for mid-2001 and mid-2031
(2001年年中及2031年年中人口金字塔之比較)
(資料來源: 人口政策專責小組報告書)
Introduction

- Enhanced recovery programme (ERP) in TKA
  - quicker functional recovery
  - reduced morbidity
- Principles
  - Preop comprehensive assessment
  - Good multimodal pain control
  - Intensive rehabilitation
  - Avoid complications

Multidisciplinary Collaboration

• Specialized team approach to create an optimal regimen of patient-centered care
  – Orthopaedic surgeons
  – Anaesthesiologists
  – Nurses
  – Physiotherapists
  – Occupational therapists
  – MSW
1) Preoperative comprehensive assessment

Surgeon

Anaesthesiology

Nurse

Allied health: OT, PT
2) Preoperative Education
3) Good multimodal pain control

- **Intra-operative**
  - Periarticular injection of mixture of drug
  - Immediate postop pain control

- **Post-op**
  - Acute Pain Service by Anaesthesiologist

4) Intensive rehabilitation
Early Postop Mobilization

• Focus on early mobilization
  – Enhanced rehabilitation
  – Reduces the risks of bed-ridden morbidity
    • eg DVT, pneumonia, UTI
Intensive physiotherapy training
5) To avoid complications
Dedicated surgical team

- Reducing operation time
- Minimizing complication
Dedicated Anaesthesiologist

• Regional anaesthesia is superior to general anaesthesia
  – reduces postoperative complications by 30-60%

Patient Blood Management

- Blood transfusion
  - Prolonged hospital stays
  - Morbidity
- Reducing the blood loss & transfusion
  - Transfusion guideline
  - Intra-articular tranexamic acid

Deep Vein Thrombosis prophylaxis

- Mechanical
  - Sequential compression Device

- Chemical
  - Aspirin 300mg for 2/52
Objectives

• Since May 2013, the traditional rehabilitation plan was modified
  – ERP was implemented for patients after primary TKA

• Aim
  – To review the outcome of the ERP
    • Compare with traditional rehab before May 2013 as control
Materials and Methods
Methodology

• Inclusion
  – Patients, who were transferred to the rehabilitation hospital after primary TKA done
    • between May 2013 and January 2014, in the ERP
Methodology

• Case-control study
  – Case
    • Patient in ERP
  – Control
    • Patient traditional rehab in historical cohort (May 2012 - Jan 2013)
  – Same discharge criteria

• Statistical Analysis
  – SPSS
Outcome measures

1. Rehabilitation outcome at OPD FU in 6/52
   - Knee Society Knee Score (KSKS)
   - Knee Society Knee Function Score (KSKFS)
2. Length of stay in rehabilitation
3. 30 day Readmission Rate
Results
## Patient’s data in Traditional Vs ERP

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>ERP</th>
<th>P-value</th>
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<tbody>
<tr>
<td><strong>No of patients</strong></td>
<td>168</td>
<td>168</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>73.4±9.5</td>
<td>72.7±8.5</td>
<td>0.81</td>
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<tr>
<td><strong>Sex (F:M)</strong></td>
<td>123:39</td>
<td>130:38</td>
<td>0.72</td>
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<tr>
<td><strong>Diagnosis (1ºOA :2º OA)</strong></td>
<td>150:18</td>
<td>152:16</td>
<td>0.75</td>
</tr>
<tr>
<td><strong>Unilateral : Bilateral</strong></td>
<td>142:26</td>
<td>140:28</td>
<td>0.77</td>
</tr>
<tr>
<td><strong>KSKS</strong></td>
<td>50.1±2.5</td>
<td>48.4±2.5</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>KSK Functional Score</strong></td>
<td>38.4±4.5</td>
<td>36.5±3.4</td>
<td>0.79</td>
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# Outcome measures

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>ERP</th>
<th>Statistical Sig</th>
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<tr>
<td><strong>Rehabilitation Outcome</strong></td>
<td></td>
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<tr>
<td>a. <em>KS KS</em></td>
<td>76.5±10.5</td>
<td>80.1±12.5</td>
<td>0.72</td>
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<tr>
<td>b. <em>KSK Functional Score</em></td>
<td>80.2±12.5</td>
<td>78.5±13.9</td>
<td>0.85</td>
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<tr>
<td><strong>30 day Readmission Rate (%)</strong></td>
<td>1.7%</td>
<td>2.4%</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>LOS (day)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><em>Uilateral TKA</em></td>
<td>13.4±5.5</td>
<td>7.1±1.8</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td><em>Bilateral TKA</em></td>
<td>20.5.5±4.5</td>
<td>13.4±2.1</td>
<td>&lt;0.05</td>
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Cost-effectiveness

• Cost of In-patient rehab : $3740/day

• LOS difference : 7 days

• Cost Saved in rehab by EPR compared with tradition rehab
  – $4.3 Million ($3740 \times 7 \times 168)
Other benefits of ERP

- Increase bed availability for rehabilitation other orthopaedic condition
  - Spinal cord injury patient
Conclusion

• The ERP after TKA
  – Improving efficiency of rehab
    • reduce length of hospital stays
    • maintaining rehabilitation outcome

• With aging population of HK,
  – Increasing efficiency of TKA service is important
Thank You