

Multidisciplinary approach to shorten hospital stay in ultra major orthopaedic surgery

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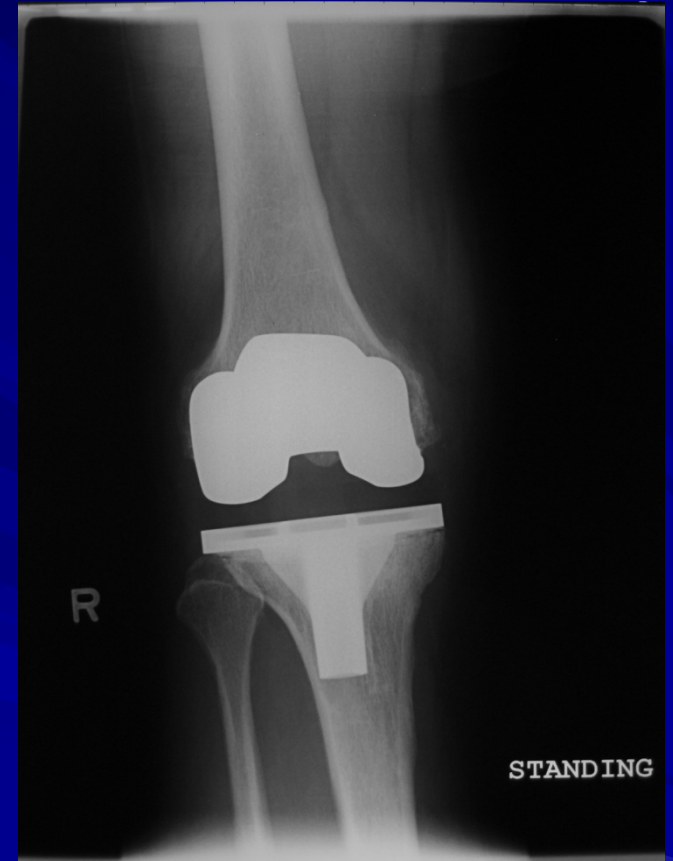
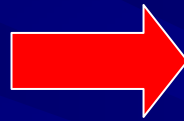
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Introduction

- Total knee arthroplasty (TKA) had been performed for more than 30 years
 - Restore mobility and function of patient
- Excellent survival of more than 95% at 10 years



Length of stay in acute hospital after TKA

- USA: 3 to 5 days
- Scandinavian: 5 to 7 days
- Australia: 5 days

How are we doing in Hong Kong?

- In 2009, 1200 TKAs were done in all 13 Hospital Authority orthopaedic units
- The average length of stay in all HA orthopaedic units was 13.5 days (range, 4 to 184 days)

Usual patient arrangement before TKA

- Patient admitted one working day before surgery for anesthetist assessment
- Cross match the day before operation

A new multidisciplinary program to shorten hospital stay for total knee arthroplasty was adopted in Prince of Wales Hospital in 2009



Aims of program

1. Shorten hospital stay of each patient undergoing total knee arthroplasty
2. Ease patient's anxiety especially during the pre-operative period
3. Maximize the utilization of ward bed
4. Ease tight bed situation especially during outbreak of infectious disease
5. Increase cost-effectiveness of each total knee arthroplasty surgery

Outline of program

- Pre-operative Education Class
- Pre-operative Anaesthetic Clinic (POAC)
- Same day admission for surgery

Details of program

1. Pre-operative Education Class
 - ~ 4 to 8 weeks before surgery
 - Organized by orthopaedic surgeons and nurses, general service assistant, physiotherapist, pain nurse and volunteer of the hospital
 - Arrange all the pre-operative investigations
 - Family members were encouraged to attend

- Assessment by surgeon
- Detail explanation of the procedure, expected outcome of the operation, risk and possible complication
- Signing of consent form



- Conduct pre-operative education by orthopaedic nurse
 - patient have more understanding of the operation, rehabilitation phase and outcome in order to relieve the tension of the patient and family



- Pain nurse will explain the post-operative pain relief modality
 - Patient controlled analgesics, continuous epidural infusion etc



- Physiotherapist will teach patient pre-operative breathing exercise and limb exercise
 - lower the risk of post-operative chest infection and venous thromboembolism



Details of program

2. Pre-operative Anaesthetic Clinic (POAC)
 - ~ 4 to 8 weeks before surgery
 - Patient will be assessed by anaesthetist in the same afternoon after the Pre-operative Education Class
 - this will save one day of travel by patient and avoid inconvenience
 - Anesthetic nurse will inform the patient about the instruction on fasting and the medications' matters after fasting
 - Physician will help to optimize the patient before the operation

Pre-operative Anaesthetic Clinic



Details of program

3. Same day admission for surgery
 - Patient was admitted 2 to 4 hours before the operation
 - Pre-operative preparation performed by orthopaedic nurse and orthopaedic surgeon,
 - cross match
 - marking of operating limb
 - surgical safety enhancement procedure (surgery 1,2,3)
 - Fasting time was adjusted to keep it between 6 to 8 hours

Outcome measures

- LOS in acute hospital, unplanned readmission rate and operation cancellation rate of our unit before and after implementation of the program
- Compare the LOS of our unit with the average LOS of all other HA orthopaedic units
- The overall bed days being saved in one year

Materials

- 125 patients adopted the new program were compared with 100 patients using the old program, with the same discharge protocol
- Patient with new program were compared with 1068 patients undergone TKA in all other HA orthopaedic units in 2009

Statistical test

- Student t test
- Chi square test
- Fisher Exact test
- Significance level, $p < 0.05$

Results

Demographic data

■ Age

– Old program

■ Average 70 y.o (range, 49 – 85 y.o)

– New program

■ Average 68 y.o (range, 51 to 84 y.o)

$p = 0.055$

Length of stay in acute hospital

■ Old program

- Average 9.9 days (range, 3 to 47 days)

■ New program

- Average: 8 days (range, 3 to 98 days)

$p = 0.015$

■ HA overall

- Average: 13.5 days (range, 4 to 184 days)

$p < 0.001$

Unplanned readmission rate

- Old program: 1% (1 in 100 patients, wound cellulitis)
- New program: 0.8% (1 in 125 patients, wound haematoma)

$p = 0.874$

Operation cancellation rate

- Old program: 1 cancellation (1%)
- New program: No cancellation

$p = 0.446$

Bed days saved

- The new program could save up to 238 bed days per year (125 TKAs x 1.9 days/TKA) in one unit
- If adopted by all HA orthopaedic units, it could save up to 6600 bed days per year (1200 TKAs x 5.5 days/TKA)

Discussion



Achievement

- 95% of patients undergone TKA had adopted this new program
- This new multidisciplinary program significantly shortened hospital stay by two days per patient undergone total knee arthroplasty
- The unplanned readmission rate did not differ significantly between the new and old program
- No patient was cancelled for operation after admission because of medical reason, insufficient bed, cross match unavailability issue etc

- The hospital stay (8 days) using this program was significantly lowered than the HA overall hospital stay (13.5 days), 41% (5.5 days) reduction in the length of stay undergoing total knee arthroplasty
- HA could save HK\$23 million/year in one single operation using this program (5.5 days x 1200 TKAs x HK\$3500 – O&T costing for inpatient acute service per day)

Implications

■ Clinical

- Shorten hospital stay of each patient undergoing total knee arthroplasty
- Minimize patient's chance of hospital acquired infection
- Ease patient's tension especially shorten pre-operative hospital stay

■ Economical

- Maximize the utilization of ward bed
- Ease tight bed situation especially during outbreak of infectious disease
- Increase cost-effectiveness of each total knee arthroplasty surgery
- In conjunction and facilitate the scope of service of hospital, cluster and HA

Problems encountered

- Bed availability
 - Tight bed situation
 - Good communication between nurses and surgeons
 - ? Day admission ward
- Cross match issue
 - Liaise with blood bank
- DVT prophylaxis
 - Need to be given 12 hours before the operation (usually the night before)
- Medical problems
 - Physician will come and help to solve the medical problems encountered during POAC



Application of the program

- This program serves as a roll model to all orthopaedic elective surgery, at least 90% of the patients could adopt this program
 - More than 75% of the revision joint replacement surgeries in our unit had adopted this approach
- However, there are some unresolved problems
 - DVT prophylaxis before surgery
 - Patients with known antibody in previous cross match
 - Anti-coagulated patients need special arrangement before surgery

Conclusion

- This multidisciplinary program has kept abreast of development of new service models for the benefit of patients and the Hospital Authority

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The Prince of Wales Hospital



Thank you

