



Translating evidence-based protocol of wound drain management for total joint arthroplasty into practice: A quasi-experimental study

Lap Fung Tsang MSc (MMR), MN, APN ^{a,*}, Hang Cheong Cheng MD, FHKAM (Orth), FHKCOS (HK), FRCS (Edin), MBBS (HK), CON ^b, Hon Shuen Ho MD, FHKAM (Orthopaedic Surgery), FRCSEd (Orth), FHKCOS, AC ^b, Yung Chak Hsu MD, FRCS (Edin), FHKCOS, FHKAM, AC ^b, Chiu Man Chow PDANP (M&L), MSS (Coun), BHS (Nur), FPHKAN (Ortho) ^b, Heung Wah Law MN, APN ^b, Lup Chau Fong BSHS, NO ^c, Lok Ming Leung MN, APN ^b, Ivy Ching Yan Kong MPHIC, FPHKAN (Ortho), FPHKAN (N&HCM), DOM (O&T) ^b, Chi Wai Chan MB,BS (HKU), FRCS (Edin), FHKCOS, FHKAM (Orth), FCSHK, FHKCOS (Rehab), COS (O&T) ^b, Alice So Yuen Sham MSSC, MBA, CGMN ^a

^a Nursing Services Division, United Christian Hospital, Hong Kong Hospital Authority, Hong Kong

^b Department of Orthopaedics & Traumatology, United Christian Hospital, Hong Kong Hospital Authority, Hong Kong

^c Department of Operating Room, United Christian Hospital, Hong Kong Hospital Authority, Hong Kong

KEYWORDS

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protocol;
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Blood loss;
Blood transfusion;
Drain removal;
Record form

Abstract Background: Although various drains have long been used in total joint replacement, evidence suggests inconsistent practice exists in the use of drainage systems including intermittently applying suction or free of drainage suction, and variations in the optimal timing for wound drain removal. A comprehensive systematic review of available evidence up to 2013 was conducted in a previous study and a protocol was adapted for clinical application according to the summary of the retrieved information (Tsang, 2015).

Aims: To determine if the protocol could reduce blood loss and blood transfusion after operation and to develop a record form so as to enhance communication of drainage record amongst surgeons and nurses.

* Corresponding author. Nursing Services Division, United Christian Hospital, Hong Kong Hospital Authority, Room 250, 2/F, Block F, 130 Hip Wo Street, UCH, KLN, Kwun Tong, Hong Kong. Tel.: +852 52153340; fax: +852 39495540.
E-mail address: tsanlf1@ha.org.hk (L.F. Tsang).

Methods: A quasi-experimental time-series design was undertaken. In the conventional group, surgeons ordered free drainage if the drain output was more than 300 ml. The time of removal of the drain was based on their professional judgement. In the protocol group the method of drainage was dependant of the drainage output as was the timing of the removal of the drain. A standardized record form was developed to guide operating room and orthopaedic ward nurses to manage the drainage system.

Results: The drain was removed significantly earlier in the protocol group. Blood loss rate at the first hour of post-operation was extremely low in the protocol group due to clamping effect. Blood loss in volume during the first three hours in the protocol group was significantly lower than that in the conventional group. Only in 11.1% and 4% of cases was it necessary to clamp at the three and four hour post-operative hours. No clamping was required at the two and eight hour postoperative period. There was no significant difference in blood loss during the removal of the drain and during blood transfusion, which was required for patients upon removal of the drain in the two groups.

Conclusion: This is the first clinical study to develop an evidence-based protocol to manage wound drain effectively in Hong Kong. Total blood loss and blood transfusions were not significantly different between the conventional and protocol groups. A standard documentation document is beneficial to enhance communication between doctors and nurses as well as to monitor and observe drainage effectively.

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Editor comments

While the insertion of drains is not standard practice for arthroplasty patients in all settings throughout the world, their use and the length of insertion are worthy of consideration. This research project, linked to a previous systematic review by the same author, outlines a change in practice for wound drain management for patients following a total knee replacement. The research is a good example of practice change that considers any associated complications with a change in practice. The management of drains is altered to allow more autonomy by nursing staff in terms of their removal but also allows for a better patient experience while ensuring there are no associated increases in negative outcomes.

PM

Introduction

The application of wound drain is commonly used in orthopaedic surgery, especially for total joint arthroplasty (TJA). The purpose of the drain is to remove any fluid collection, prophylactically prevent fluid accumulation, accelerate the healing process, promote tissue approximation, minimise the risk of infection and decrease postoperative pain (Schein, 2008). For TJA the use of a pressure suction drain is mainly to prevent haematoma accumulation (Esler et al., 2003).

Some studies revealed that placement of a pressure suction drain may influence the tamponade effect which may potentially lead to increased blood loss (Esler et al., 2003; Pornrattanamaneewong et al., 2012). Therefore, it may be reasonable to clamp the drain in the early post-operative period in order to control blood loss (Pornrattanamaneewong et al., 2012). However, clamping the drain may lead to the formation of haematoma so there needs to be some way to balance the effect of clamping. On the other hand placement

of a vacuum drain creates an entry portal for bacteria and thus increases the risk of infection (Kim et al., 1998; Pornrattanamaneewong et al., 2012). Consequently, the longer a drain remains in situ, the risk of infection increases (Chintamani et al., 2005).

It is common practice in many parts of the world not to use drains in this patient population. A clinical guideline for the Enhanced Recovery Programme for Total Joint Replacement was developed to help reduce the need for drains (Barker, 2010). Despite this there are areas of practice where the use of a drain is still the preference of the surgeon following TJA.

In regard to the management of a pressure suction drain as well as the optimal time of wound drain removal, a recent study summarized the literature with a view to developing an evidence-based protocol for the management of wound drains for patients following TJA (Tsang, 2015). Clamping the drain 1-hour post-operatively in the operating theatre or in the recovery area is recommended (Roy et al., 2006). Wound drains should be clamped for one hour

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