Reducing Risk Of Post-Operative Complications After Joint Replacement Surgery

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INTRODUCTION

A multitude of factors influence the development of surgical site infections. In the post-operative phase, maintaining a covered incision during the first 72 hours, while skin closure takes place, reduces the risk of a surgical site infection.

While the incision is initially dressed in a sterile environment, post-operative dressing changes are performed under aseptic guidelines. The longer the wound remains covered, without exposure to the external environment, the more healing can occur which in turn reduces the risk of surgical site infection.

A surgical wound heals by primary healing; there is minimal tissue loss and the edges of the wound are held together by sutures or staples. It takes approximately 48 hours before epithelialisation occurs.[1,2] During epithelialisation, epithelial cells migrate from surrounding wound edges or from hair follicles, sweat or sebaceous glands to cover the wound. These fragile and easily removed cells appear as a thin translucent film over the wound. Until epithelisation is completed the wound remains open which creates a potential infection track to the prosthesis by any inadvertent contamination.

As peri-operative nurses, we need to consider the patients' wounds for 48-72 hours post surgery. This includes selecting dressings that do not leak, which would provide a potential route for micro-organisms to enter the wound, and dressings that the ward staff do not have to take down in the first crucial 48 -72 hours while epithelialisation is occurring.

BACKGROUND

Advances in infection control practices include improved operating room ventilation, sterilisation methods, barriers, surgical technique, and availability of antimicrobial prophylaxis. Despite these activities, surgical site infections remain a substantial cause of morbidity and mortality among hospitalised patients.

In 2006, the Victorian Hospital-Acquired Infection Surveillance System (VICNISS) System calculated the cost of superficial and deep post-operative surgical site infections following total knee and hip arthroplasties. The study found that when the excess length of stay (LOS) and all additional hospital costs were added together 126 infections cost the Victorian healthcare system a total of $5,019,994 or $251,000 per month.

The average excess LOS per infection, per patient, was 27 days (range 2–142 days). The average additional cost following hip arthroplasty infection was $34,138.65 AUD and following knee arthroplasty was $40,940.00 AUD.[3]

Proper aseptic technique is one of the most fundamental and essential principles of infection control in the clinical and surgical setting. The word "aseptic" is defined as "without microorganisms," and aseptic technique refers to specific practices which reduce the risk of post-surgical infections in patients by decreasing the likelihood that infectious agents will invade the body during clinical procedures.

Aseptic technique also encompasses practices performed immediately before and during a surgical procedure to reduce post-operative infection.

<u>These include:</u>

- Hand washing
- Surgical scrub
- Using surgical barriers, including sterile surgical drapes and proper personal protective equipment, including head coverings, surgical masks and gowns, gloves, and shoe coverings
- Patient surgical prep
- Maintaining a sterile field
- Using safe operative techniques
- Maintaining a safe environment in the operating room

The peri–operative environment is controlled and managed to minimise the risk of contamination during a surgical procedure. However, once the patient leaves the operating suite they enter a less controlled area; then, the only thing between the wound and the potential contaminates of the ward environment is the dressing!

OBJECTIVE

The aims of this study were to reduce the number of arthroplasty patients who required a dressing change within the first 48-72 hours post-op with the goal of reducing the risk of wound contamination and resulting infection.

METHOD

The orthopaedic surgeons at Geelong Private Hospital were requested to use multifunctional polymeric membrane dressings* following hip and knee arthroplasties. This was a change from the gauze, combine, and island dressings previously applied after closing the case.

35 arthroplasty patients were tracked during their post-operative care. The polymeric membrane dressings were monitored daily for exudate absorption. The dressings were changed when it became apparent that the dressings were approximately 75% saturated with blood or exudate.

When this occurred, the old dressing was removed and a new polymeric membrane dressing was applied. Since the home is a cleaner environment than the ward, if at 72 hours a dressing was still on the wound, and it could be left in place, the patient was sent home and instructed to remove it after an additional 24 hours. The duration of the dressing wear times were documented.

RATIONALE

Polymeric membrane dressings were selected because they have been shown to 1) provide long wear time by removing and locking into the dressing excess exudate; 2) maintain a moist wound healing environment; 3) provide a barrier to microorganisms; 4) be easy to apply and are comfortable for the patient as they are adaptable to the body's contours; 5) reduce the edema, inflammation, pain and bruising associated with tissue damage;[4,5,6] 6) not stick to the wound bed;[7] 7) help reduce the risk of wound infection while simultaneously supporting excellent healing when used in tropical, desert and temperate environments.[4,6]

RESULTS

Of the 35 patients monitored to date:

- 74% of patients were discharged with the original dressing in place
- 85% of patients did not require a dressing change within 72 hours
- 94% of patients did not require a dressing change within 48 hours.

There were no wound infections in these 35 arthroplasty patients at their 6 week post-operative check up.

Polymeric membrane dressing appearance 24 hours after application in Operating Theatre.

Hip Arthroplasty 48 hours after application of polymeric membrane dressing in the operating theatre. No manual cleansing performed on this wound after dressing removal.

CONCLUSION

The polymeric membrane dressings are very suitable for use post-operatively following joint replacement surgery. Use of the dressings reduced the need for dressing changes in the first 72 hours post surgery. Even when the incision site dressings were changed before 72 hours and replaced with new polymeric membrane dressings there were not any surgical site infections recorded. The recording of surgical site infections was per the Australian Council of Health Care Standards (ACHS) Clinical Indicators for infection which requires the reporting of any surgical site infections at both 12 and 28 days post-surgery.

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*PolyMem® Dressings are made by Ferris Mfg. Corp., Burr Ridge, IL 60527 USA

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