

Comparing hand-painting with sponge-forceps painting in skin preparation in upper limb surgery

¹Toyat SS; ²Teo KL; ²Anthony M; ³Lee DD; ¹Arsad SR; ¹Nawawi RF

¹Orthopaedic & Traumatology Department, Hospital Selayang, Kepong Highway, 68100 Batu Caves, Malaysia.

²Orthopaedics Department, Hospital Tengku Ampuan Rahimah, Jalan Langat, 41200 Klang, Malaysia.

³Department of Orthopaedics, Hospital Putrajaya, 62250 Putrajaya, Malaysia.

PURPOSE:

We compared effectiveness of standard sponge paint technique to hand-painting in removing organisms from skin during upper limb pre-operative preparation.

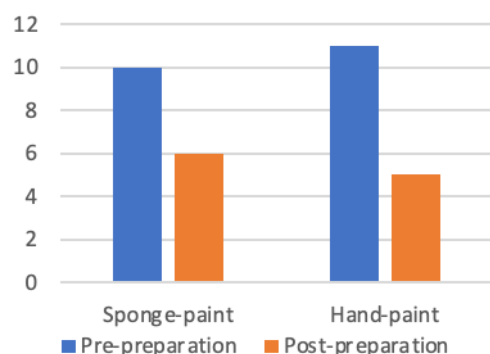
MATERIALS & METHODS:

21 patients for upper limb surgery were randomised to two groups. In first group, antiseptic solution was applied with gauze held in sponge forceps. In second group, gauze was applied manually using sterile gloves. All were prepped by single orthopaedic trainee using 10% povidone-iodine. Samples were taken from 2nd webspace before and 90 seconds after site preparation. Outcome measure was presence of positive culture swabs. Statistical analysis was performed using exact Fisher's test, with P-value of ≤ 0.05 statistically significant.

RESULTS :

10 and 11 patients were allocated to first and second group respectively. Post-preparation, there was 40% reduction in positive cultures using sponge-paint compared to 55% using hand-paint. There was no significant difference between sponge-painting and hand-painting ($P=0.6699$).

Figure 1: Patients with positive culture swab



Post-preparation, positive samples grew mainly *Bacillus spp.* No patient developed surgical site infection (SSIs) over 1 year.

DISCUSSION:

This study shows microbiology and clinical outcomes in hand-painting are similar to sponge-painting. *Bacillus spp.* is most frequent organism persisting post-preparation, but rarely cause SSIs,¹ consistent with our study findings. The few studies available on methods of application mainly reviewed novel devices in healthy volunteers.²⁻³ To our knowledge, ours is the first evaluating hand-painting in patients going for surgery. Limitations of our study are inadequate 90-second preparation time and small sample size.

CONCLUSION:

Effectiveness of hand-painting is comparable to sponge-painting in upper limb surgery.

REFERENCES:

- ¹ Xu PZ, Fowler JR, Goitz RJ. Prospective Randomized Trial Comparing the Efficacy of Surgical Preparation Solutions in Hand Surgery. *Hand (N Y)*. 2017 May;12(3):258-264.
- ² Seigerman DA et. al. A Comparison of Two Sterile Solution Application Methods During Surgical Preparation of the Hand. *J Hand Surg Am*. 2016 Jun;41(6):698-702.
- ³ Webb J, Hilliam R, Bainbridge LC. A novel device for preoperative skin preparation to reduce the risk of injury and surgical site infection during lower limb surgery. *J Perioper Pract*. 2018 May;28(5):109-114.