

## Quantification Analysis of the Intraoperative Bacterial Contamination Rate and Level of Osteochondral Autografts

Abdulaziz Z. Alomar, MD, MSc, FRCSC, SAUDI ARABIA

King Saud University, College of Medicine  
Riyadh, Riyadh, SAUDI ARABIA

### Summary:

Our study has shown that a high rate (29%) of osteochondral autografts contamination can be expected during graft harvesting and preparation. Quantification analysis has shown that the contamination level of the autograft during harvesting or by accidentally dropping was very low.

### Abstract:

#### BACKGROUND

Inadvertent contamination of osteochondral (OC) autografts during harvesting and preparation can result in significant complications, forcing the operative team to weigh infection risk following reimplantation against discarding the OC fragment. The most commonly reported contamination mechanism is accidentally dropping an OC fragment; however, its contamination level is not established. The rate and level of contamination during standard harvesting and preparation are also unknown.

#### PURPOSE

To quantitatively evaluate the rate and level of bacterial contamination of OC autografts during harvesting and preparation compared to those of accidentally dropped autografts.

STUDY DESIGN: Controlled laboratory study

#### METHODS

Under sterile conditions 138 fresh OC specimens were harvested and retrieved from 23 primary total knee arthroplasties (TKAs). Sixty-nine OC fragments were used as controls and 69 OC fragments were dropped onto the operating room floor. Each specimen was incubated for aerobic and anaerobic growth, and the number of colony-forming units (CFU) per gram was calculated.

#### RESULTS

Contamination rates (positive cultures) for the control and dropped groups were 29% (n=20/69) and 42% (n=29/69), respectively. The most common organisms identified were *Staphylococcus aureus* (40%) in the control group and *S. epidermidis* (24.1%) and *Bacillus* species (20.7%) in the dropped group. The contamination level (CFU/g) for both groups was very low. Although, the dropped group has higher level of contamination compared to the control group. The median and range of the CFU/g of the contaminated specimens in the dropped and control group were 27 [1-120] and 3 [1-15] CFU/g, respectively.

#### CONCLUSION

A relatively high rate of OC autograft contamination can be expected during harvesting and preparation (29%) or after accidentally dropping a specimen (42%). Although the types of organisms isolated differed between specimens contaminated during harvesting and preparation and dropped specimens, quantification of autograft contamination level revealed a very low CFU/g in either case.

#### CLINICAL RELEVANCE

Intraoperative autograft contamination carries a very low risk of infection because their level of contamination (in

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CFU) is low. Therefore, saving and reimplantation of grafts with a known contamination incident after proper decontamination is highly recommended over discarding them or using an allograft. Routine decontamination of all autografts before implantation and optimizing the operating room environment will further minimize the risk of surgical site infection.