



Strategies for Eliminating Retained Bone Cement

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Sterile Processing (SP) professionals should stay focused on identifying and eliminating all tray defects. Sometimes, tray defects can be inconsequential; other times, they can lead to serious problems for Operating Room (OR) staff and, potentially, the patient. One way to work on eliminating tray defects is to focus on a specific type of defect, educate and train staff members about the defect, and modify processes to prevent defects of that type from reoccurring.

Retained bone cement occurs when bone cement from a previous surgical case is present on an instrument inside a sterilized instrument tray. Retained bone cement should be considered a type of contamination and must be addressed before proceeding with the surgical case. *Note: Retained bone cement occurs most commonly with knee arthroplasty cases but may happen with any surgical case that uses bone cement.*

I recall being a new scrub nurse and learning how to scrub for total joint cases. We would have four total joint cases in a single eight-hour day, which made for a busy and fast-paced shift. I was shown how to do one case and then expected to also do the next one. I had just finished scrubbing in and putting the sterile drape on my mayo stand as the patient was wheeled into the OR. To be ready on time, I was anxiously and

methodically going through the many instrument trays to pull out the items we would need. The spinal anesthetic was administered, and the OR team was about to start positioning the patient for the procedure when I noticed something on an instrument: retained bone cement from a previous case.

Not knowing what to do, I asked the scrub nurse who was training me. He said, “I usually just flick it off and keep going.” That answer did not sit right with me, so I asked the veteran registered nurse first assistant (RNFA), who was also with us. Her eyes widened and she told me we had to tear down the entire sterile setup and start again. Fortunately, we were performing the same type of case later that day, so we could use that case cart and begin resetting for the current case. There have been other times during my career where surgeons scheduled fewer cases to accommodate for the too common occurrence of retained bone cement.

Addressing the problem

Because retained bone cement can lead to both case delays and patient harm, SP professionals must do everything possible to eliminate the problem in their facilities. A meaningful quality project could be an attempt to prevent the occurrence of retained bone cement for an entire year. Let's explore how such a goal might be accomplished.

1. *Collect baseline data and continue collecting data throughout the following steps.* An effective method must be in place to report any incidents of retained bone cement. The challenge for many facilities will be the multiple ways that problems in the OR are reported, including electronic records, verbal communication, and paper-based reporting methods. Some facilities have started using their instrument tracking platforms to report instrument tray defects. All of these methods are acceptable, but if your facility uses multiple methods, it is possible that defect reports will be missed. To reduce the frequency of retained bone cement, it is imperative to settle on a single reporting system. Defect data will be valuable for driving quality improvement. As baseline data is collected, it is an opportune time to take photographs of retained bone cement (these images can be extremely valuable later in the process).
2. *Communicate the goal of achieving zero retained bone cement defects.* The value of effective and open communication cannot be overstated. It is important to establish awareness and excitement around a common goal that is simply stated so all parties can participate in achieving it. This should be communicated to the Sterile Processing department (SPD), surgeons and other staff. In



the SPD and OR, there should be a place on a communication board to illustrate progress toward the goal of zero retained bone cement defects. Team huddles should also be used as an avenue to communicate collective progress to the SP and OR teams. Also, it is helpful to take advantage of electronic communications such as emails and newsletters.

3. *Implement education and procedures necessary to eliminate the occurrence of retained bone cement.* It is important to re-educate OR staff on proper point-of-use treatment procedures regarding bone cement. Any bone cement stuck on instrumentation should be removed at the point of use, preferably before the cement cures. Even with diligent OR staff, it is possible to miss retained bone cement. Education will be important for the SP team as well and also having strategies in place for identifying and removing any residual bone cement.

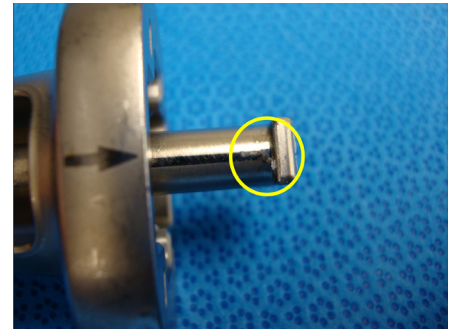
It is important for SP technicians to understand that most of the traditional cleaning methods used in the SP decontamination area are not effective at removing cured bone cement. Soaking, brushing and even using automated cleaning equipment (e.g., ultrasonics and washers) will not remove bone cement that is dried on an instrument. It is critical to follow the manufacturer's instructions for use (IFU) for proper removal. Using a chemical product specifically designed to remove bone cement from instruments is an appropriate method. Cement removal with a chemical product should be performed only in the decontamination area of the SPD to ensure technicians are equipped with the proper personal protective equipment (PPE). If cement is found at the assembly station

on the clean side of the SPD, the instrument should be returned to the decontamination area for removal and re-cleaning (this may even be an additional metric to track). If cement remains after using a chemical remover, contact the device manufacturer for guidance. *Note: Some SP professionals may attempt to use another instrument to chip hardened bone cement from a device. Doing so is not advised because it can seriously scratch, gouge or otherwise damage the devices and pose an injury risk for the technician.*

Learning from and working with OR teams is critical for preventing retained bone cement. While total joint cases require many sets and instruments, the cementing process typically only involves a few devices, including impactors, Freer elevators, and tonsil hemostats. These are often the culprits when it comes to retained bone cement, but there may be other instruments based on what the surgical team is using to remove the cement. Develop a list of "usual suspects" with the help of the OR. This is where the pictures taken during the data collection and reporting phases will be helpful. Pictures of these instruments might be used in training materials and posted on walls in decontamination areas or on assembly stations as reference guides. The purpose is not to reduce the inspection process to a few instruments but to enhance the inspection of select instruments to prevent recurrence of retained bone cement in the OR.

Collaborating for long-term success

Procedurally, it is essential to look at both the OR and SPD for areas of improvement. In the OR, after the removal of cement, a special basin or tray may be used as an identifier to SP professionals that the instruments were



Impactor handle with residual cement

used during the cementing process; these trays could be color-coded, tagged or otherwise labeled to clearly identify that these devices came in contact with bone cement. The SPD could then pay special attention to that tray, carefully checking each device for retained bone cement and using a chemical removal method if approved by the device's IFU. *Note: This example is an actual process change that one hospital I visited implemented with remarkable success. A second quality inspection of cement-specific instruments by another SP technician could help make this process even more effective.*

Finally, it is essential to continue tracking and trending reports of retained bone cement found in the OR and to communicate such incidents to SP, surgeons and OR teams. This is the only way to know whether the quality initiative is working. With special attention paid to these problematic instruments, improved outcomes will surely result. If the problem is not eliminated or the outcomes not improved, it is vital that the SP and OR teams continue to partner to address the situation. Do not give up on this important goal! Your continuous efforts to eliminate retained bone cement will improve efficiency and patient outcomes. Once the retained bone cement problem is minimized or eliminated, these quality project concepts can be adapted and applied to other areas of concern. **P**