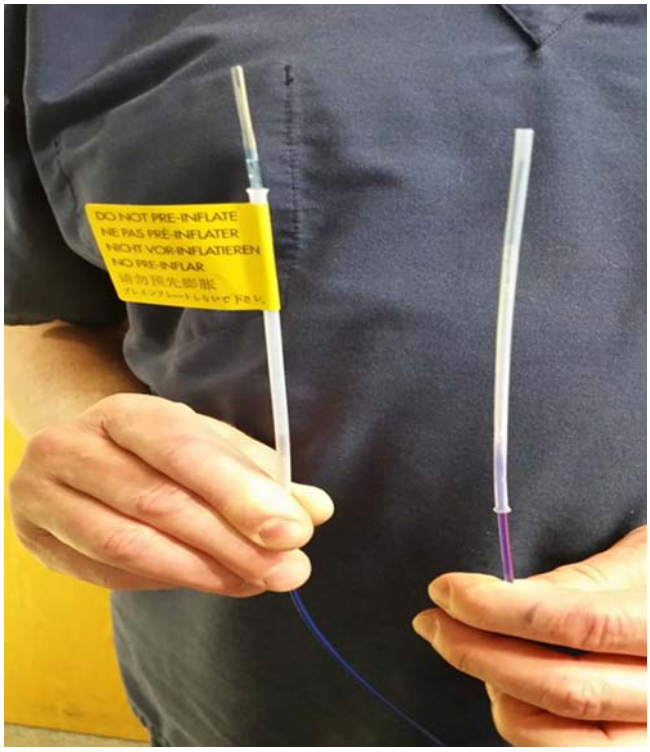

Fig. 1. Cook Medical balloon (left) and Boston Scientific balloon.

not fit into the endoscope channel, either because of their size or the attachment of a nonremovable flag. Cleaning brushes should not pass through the lumen of an embedded sheath, thus leading operators to believe the channel is unaltered and that the endoscope has been properly and completely cleaned and disinfected. Next, a sheath count, verified by a second person or 2-stage discarding by the same person, should be implemented. This step would occur during and at the end of the procedure. During the procedure, whenever a device is unpackaged and disposable components are removed, instead of immediately throwing out the packaging and components (ie, sheaths), they should be retained and then recounted and recorded during room turnover. Meticulous endoscope tracking and cleaning logs should be kept. Finally, new technologists should be made aware of these risks during their orientation. Since implementing the sheath counts and education, no similar incidents have occurred at our facility.

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Challenges for quality control of institutional bone banking in developing countries

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PREVIOUS PRESENTATION. Some data in this study correspond with our previous reports on our institutional bone bank activities (Stepanovic ZL, Ristic BM. The effectiveness of bone banking in Central Serbia: audit of the first seven years. *Cell Tissue Bank* 2014;15:567–572 and Stepanović ŽLj, Ristić BM. Bacterial infections associated with allogenic bone transplantation. *Vojnosanit Pregl* 2015;72:427–430).

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To the Editor—To assess the contamination rate of retrieved bone allografts and the infection rate after bone allotransplantation, we performed the retrospective review of 2 audits to evaluate the quality of bone bank activities in the University hospital in Central Serbia using data from January 2007–December 2019.

Institutional bone banks are the widely accepted source of allogenic bone grafts. They are liable for their harvesting, testing,

Table 1. The Ratio Between Two Audits Concerning the Overall Number and Type of Donor and Recipient Procedures, the Number of Discarded Allografts Due to Bacterial Contamination, and Serology

Characteristics	Jan 2007–May 2013	Jun 2013–Dec 2019	*P* Value[a]
No. of THA/HA	749/683	1,132/692	.00001
No. of allografts/surgery	295/1,432	267/1,824	.0002
No. of THA/HA donors	214/81	243/24	.00001
Revision ORIF surgery, no. (%)	48 (26.66)	20 (13.07)	.01
Allograft contamination, no. (%)	37 (48.05)	12 (16.21)	.002
Inability to perform serology tests, no. (%)[b]	21 (27.27)	42 (56.75)	.005
No. of discarded allografts, no. (%)	77 (26.1)	74 (27.71)	.78

Note. THA/HA, total hip arthroplasty/hip arthroplasty; ORIF, open reduction internal fixation.
[a]$P < .05$ indicates a significant difference.
[b]Death, refusal, or underbudgeting.

and storage according to strict protocols.[1] Between 1% and 22% of the donated bone grafts are contaminated and thus rejected; disease transmission possible if the bone allograft is contaminated.[2–4] High-quality measures in the prevention of bone allograft contamination during retrieval and storage must be provided by any bone bank, particularly when sterilization procedures are not applied.[5]

Methods

We performed a retrospective observational cohort study involving 895 adult orthopedic inpatients at the University Clinical Center Kragujevac, in Kragujevac, Serbia, using data from January 2007–December 2019. The analysis of institutional bone banking was conducted after 2 audits including 562 donors and 333 recipients. The first audit was held from January 1, 2007, to May 31, 2013. During this period, fresh femoral head allografts were retrieved from 295 patients with femoral neck fracture or after primary total hip arthroplasty (THA). The second audit was conducted from June 1, 2013, to December 31, 2019, and 267 allografts were retrieved.

Swab samples were sent to the hospital laboratory for microbiological evaluation. Two cultures of aerobic and anaerobic microorganisms in blood agar, MacConkey agar, and chocolate blood agar were analyzed. The donors were tested for hepatitis B (HBs antigen and anti-HBc-antibodies) and hepatitis C (HCV-antibodies and HCV-RNA), human immunodeficiency virus (HIV1/2 antibodies), and syphilis (VDRL) at donation and 6 months after surgery, according to the bone bank protocol. Acceptable bone allografts were ready for use 6 months after admission and were stored for a maximum of 5 years. To prevent bone allograft contamination during thawing, we immersed it in a 0.9% saline with an extremely high concentration of bactericidal antibiotics (eg, amikacin or clindamycin) according to the standard procedure of our bone bank.

Bone allograft-related surgical site infections (SSIs) were recognized and analyzed by surgeons and institutional infection control personnel according to widely accepted surveillance methods for SSI.[6]

Results

The ratio between the overall number of procurement procedures and the origin of bone allografts was statistically highly significant in the second audit compared to the first survey (Table 1). The overall rate of discarding bone allografts after 13 years of bone banking was 26.86%. There was a significant decrease in allograft contamination from 12.54% during the first audit to 4.49% in the second survey ($P < .05$). The inability to perform serology retests after 6 months (15.72%) in the second survey significantly increased compared to the first audit (7.11%; $P < .05$).

The organisms most commonly identified were *Staphylococcus* spp in both audits. No statistical significance was found between the 2 audits concerning the number of particular surgeries. The exception was a significant decrease in the number of allografts used in revision trauma surgery in the second survey compared to the first survey ($P = .01$). The overall allograft-related infection rate after 13 years of bone banking was 1.80%. Moreover, 4 recipients (2.22%) in the first survey developed surgical site infections (SSIs) following trauma surgery. Coagulase-negative *Staphylococcus* and methicillin-resistant *Staphylococcus aureus* (MRSA) were isolated in 3 of 4 surgical site infections. The fourth patient suffered from polymicrobial infection caused by *Enterococcus faecalis*, *Proteus mirabilis*, and *Pseudomonas aeruginosa*. During the second survey, 2 recipients (1.30%) developed SSIs, one following adult scoliosis surgery, and the other following revision THA. Furthermore, 2 germs, *Acinetobacter* and methicillin-sensitive *Staphylococcus aureus* (MSSA), were isolated at the surgical site of the first recipient, and *Staphylococcus epidermidis* was found in the second recipient.

Discussion

Our results show that the hospital bone bank system operates in compliance with the high international standards, and with a low infection rate among recipients. Femoral head allografts retrieved from living donors are safe. The overall discarding rate of 26.86% correlates with 12%–33% in earlier reports.[7,8] The leading cause of allograft rejection during the first survey was allograft contamination, which led us to develop a more efficient allograft handling technique during harvesting. The inability to perform serology tests due to underbudgeting, donor death, and donor refusal to perform the serology retests was the leading cause of allograft rejection over the past 7 years. Surgical site infection (SSI) as a repercussion of the contaminated bone allograft is uncommon and ranges between 1.3% and 12%.[1,8,9] The overall allograft-related infection rate after 13 years of bone banking was 1.80%. The organism most commonly identified was the *Staphylococcus* spp in both audits.

In addition to favorable results of stringent aseptic allograft handling, we have faced inadequate institutional support and donor disinterest to participate in bone banking over the past 7 years. Both are extremely important for its efficient functioning and existence. Further improvements in bone allograft procurement are needed to reduce bacterial contamination and infection rate, as well as a well-controlled, randomized clinical trial using different techniques of allograft handling and processing, which would be of significant contribution to the medical community.

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Estimating coronavirus disease 2019 (COVID-19)–caused deaths in hospitals and healthcare units: Do hospital-acquired infections play a role? Comments with a proposal

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To the Editor—A recent paper by Giacobbe et al[1] reported that 171 of 586 patients (29%) (mean age, 64 years) hospitalized for coronavirus disease 2019 (COVID-19) in intensive care units (ICUs) of major Italian hospitals also had ventilator-associated pneumonia (VAP) caused by superinfection, mainly with *Pseudomonas aeruginosa* (35%) and *Staphylococcus aureus* (23%). These authors reported that the 30-day case fatality caused by VAP was 46% (77 of 171). Furthermore, in multivariate analysis, the odds ratio (OR) of septic shock on VAP onset was 3.30 (95% CI, 1.43–7.61; $P = .005$) and the OR of acute respiratory distress syndrome (ARDS) was 13.21 (95% CI, 3.05–57.26; $P < .001$). Both were associated with mortality.[1] These authors collected bronchoalveolar lavage fluid (BALF) from 79 of 171 patients and reported positive microbial cultures in 77 of 79 BALFs (97%).[1]

Hospital-acquired infections (HAIs) are a huge concern for hospitals in Italy. A survey by Lizioli et al[2] revealed that most HAIs in Lombardy, the Italian region with the most COVID-19 deaths, occurred in ICUs. The high prevalence of HAIs in ICUs in Italy has also been reported by other authors[3,4] who associated such infections with the use of urinary catheter, surgical drainage, and intravascular catheters, as well as mechanical ventilation.[4]

A major COVID-19 concern has been widely associated with activity in ICUs. Lockdown policy and restrictions in social habits have been implemented to decrease the burden of hospitalized people in ICUs. However, despite several reports in the literature,[5,6] a sound public debate about HAIs, particularly among elderly people with severe comorbidities, has not been addressed by politicians or journalists in Italy. Furthermore, neither a proper democratic debate nor a political discussion has included more suitable and effective protocols aimed toward greatly reducing the impact of HAIs in ICUs among COVID-19 patients. Thus far, the public debate has included issues regarding social contacts and severe acute respiratory coronavirus virus 2 (SARS-CoV-2) infection in the general population, but HAIs have not been adequately considered. Undoubtedly, the dramatic increase in COVID-19 deaths includes HAI coinfection cases. We aimed to calculate a more correct estimation of these cases using data from Italian Ministry of Health that were publicly available online on February 14, 2021. Among the entire COVID-19–positive population (2,721,879 people), 2,085 patients went to an ICU and 382,249 did not need hospitalization (good outcome–group 1); 93,577 patients died and 2,275,519 individuals were discharged or healed from the infection (good outcome–group 2). The relative risk (RR) of dying in an ICU from COVID-19 was 7.28, with an OR of 7.54 (95% confidence interval [CI], 7.22–7.87). However, the RR of dying from an HAI coinfection was 24.59, and the rate of VAP-associated death may be as low as 13.34%[1] with an OR of 28.22 (95% CI, 26.93–29.58). HAIs represent a 4-fold RR of dying during

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