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QUESTION 34: Can intraoperative or postoperative blood salvage be utilized in patients undergoing reimplantation for treatment of periprosthetic joint infection (PJI)?

RECOMMENDATION: Unknown. The limited published data on this subject suggests that the use of intraoperative or postoperative blood salvage in patients undergoing reimplantation for treatment of PJI may be beneficial, but also poses a potential risk of bacterial dissemination. Further studies are needed to evaluate the risks and benefits of this strategy.

LEVEL OF EVIDENCE: Consensus

DELEGATE VOTE: Agree: 92%, Disagree: 4%, Abstain: 4% (Super Majority, Strong Consensus)

RATIONALE

Different strategies have been used to avoid allogeneic red blood cell transfusion (ARBCT) in total joint arthroplasty due to its deleterious effects, including transfusion-associated lung injury, circulation overload and, most importantly, increased risk of PJI [1,2]. Cell salvage offers a safe, resource-saving and relatively inexpensive method to avoid ARBCT [1]. However, the main concern remains in its use in the setting of reimplantation given the possibility of persistent, undetectable infection.

There is limited data available in literature specific to the use of intraoperative or postoperative blood salvage to be utilized in patients undergoing reimplantation for the treatment of PJI. A systematic review was performed specifically evaluating if it is safe to re-infuse these products in this setting. Several level III and IV studies have examined the incidence of bacterial contamination of blood salvage equipment in elective non-orthopaedic surgery and have demonstrated little if any evidence of bacterial dissemination from blood salvage devices [3–6].

The use of intraoperative cell salvage has been supported in aseptic revision and primary hip and knee arthroplasty. It has been seen as efficacious in reducing the need for ARBCT and demonstrated cost-effectiveness [7]. A systematic review by Carless et al. evaluated 75 studies that investigated the effectiveness of cell salvage in different surgical specialties including orthopaedics [8]. They concluded that there is sufficient evidence to support the use of cell salvage. Furthermore, with advances in washing and filtration technology, new cell salvage devices continuously improve and provide a high-quality blood product for re-infusion [9].

Few absolute contraindications have been clearly stated for blood salvage [10]. Anything that results in lysis of the red blood cells is defined as an absolute contraindication. Blood that has been mixed with fluids such as sterile water, hydrogen peroxide, alcohol or any hypotonic solution will result in red cell destruction. The reason for this contraindication is end-organ damage as a result of administering lysed red blood cells [11,12]. In terms of blood contamination or infection, it has been thought that administration of this contaminated blood will lead to bacteremia or sepsis and has been established as a relative contraindication. Studies have found that contamination of processed and re-administered units obtained intraoperatively range from 9 to 30% without clinical implications [3,13].

No evidence has been found in favor or against the use of blood salvage in the setting of reimplantation beyond the fact that it reduces ARBCT. Other specialties have shown it to be a safe procedure in contaminated scenarios. ARBCT increases the risk of PJI, and thus a careful evaluation should be performed before deciding to use intraoperative or postoperative blood salvage in these patients.

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