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CORR Insights®: What Are the Frequency, Associated Factors, and Mortality of Amputation and Arthrodesis After a Failed Infected TKA?

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Where Are We Now?

In their retrospective analysis, Son and colleagues studied patients 65 years of age or older who were diagnosed with an infected TKA and

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who underwent revision between 2005 and 2014. The authors found that despite a rising incidence of prosthetic joint infection (PJI) resulting in revision TKA, the number of salvage amputations and arthrodeses related to PJI has decreased over the same time period. Unexpectedly, patients in this group who underwent amputation were more likely to die than were those who received arthrodesis.

Contemporary value-based health-care models have appropriately incentivized the avoidance of PJI [2]. During the past decade, sophisticated preoperative risk-factor recognition has become the standard of care in elective TJA. Novel tests such as alpha defensin have strengthened widespread acceptance and adoption of consensus diagnostic algorithms [1]. Strategies to counter microbial defenses such as

biofilms and refined surgical techniques have fortified treatment capabilities.

And yet, this paper provides a sobering reminder that despite these commendable scientific advancements within the field, PJI remains a monumental societal burden as well as a devastating complication for an individual patient. Treatment of PJI cost US hospitals more than USD 500 million in 2010, and is projected to exceed USD 1.6 billion by 2020 [3, 4]. The risk of amputation or arthrodesis after initial surgery for PJI is unacceptably high—between 4% and 7% according to Son and colleagues.

Where Do We Need To Go?

The study authors highlight the continuing need for strategies to mitigate these most-devastating failures of PJI. Possible avenues include prevention, diagnosis, and better treatment options. With well-documented increases in the number of TJAs performed annually,

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the number of patients at risk for PJI continues to grow, and so does the urgency for innovation. Antibiotics capable of targeting resistant organisms, phototherapy, biotherapeutics, vaccines, and biofilm disrupting agents represent the next wave of defense against PJI. Foundational bench science and subsequent clinical investigations should be tasked with standardizing PJI treatment.

In the meantime, many PJIs resist our interventions, leaving patients with unappealing treatment options: Amputation, arthrodesis, and implant retention with chronic antibiotic suppression.

An analysis examining amputation versus arthrodesis is unlikely to occur from traditional randomized control trials. Though international arthroplasty registries would seem an appropriate resource to inform decisions between salvage treatment options, the reliability of such data for PJI examination has been called into question [8], and so alternative strategies must be considered.

How Do We Get There?

The development of novel prophylactic, diagnostic, and therapeutic modalities fits well within the established bench-to-bedside paradigm, but limited biomedical research funding

could stall any progress. We must engage with the American Academy of Orthopaedic Surgeons and the American Association of Hip and Knee Surgeons and continue our political advocacy and lobbying efforts to preserve and increase funding for PJI research.

PJI may be most appropriately treated by multidisciplinary teams in tertiary care medical centers. But in addition to pure logistical challenges, numerous barriers to such a shift in practice exist, including the perception of financial disincentives for patients and hospitals, as well as a culture among surgeons to handle their own complications. Nevertheless, standardizing PJI treatment and establishing a PJI-specific registry could yield long-term benefits, including improved outcomes and rates of eradication. A registry would provide greater opportunity for meaningful data analysis and offer timely guidance for the direction of future research and treatment. Similar to the American Joint Replacement Registry, funding would likely come from stakeholders such as orthopedic societies, payers, hospitals, and industry. The addition of infection-related data into a cardiothoracic surgery registry has contributed to improved surgical site infection outcomes [5].

Regarding potential financial concerns, Waddell and colleagues [7] reported that net income was greater

for referrals compared to self-originating patients with infected TKA at a tertiary care medical center. Existing arthroplasty registries could provide a template and preexisting infrastructure for a related but PJI-specific data repository [6]. Such systematic restructuring of the traditional care pathway would require an investment in resources and substantial buy-in from orthopaedic surgeon leadership who would be tasked with developing and recruiting commitment from additional stakeholders, particularly hospitals and payers. The potential for meaningful advancements may, indeed, prove worthwhile.

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