Commentary on: "Sterile Seroma Resulting from Multilevel XLIF Procedure as Possible Adverse Effect of Prophylactic Vancomycin Powder: A Case Report"

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Postoperative surgical site infection (SSI) is the second most common health care–associated infection in the United States, second only to urinary tract infections, and resulting in an estimated 8,205 deaths in 2002 alone.[1] Furthermore, SSIs have been shown to result in a prolongation of hospital stay by 9.7 days and increase treatment cost by $20,842 per admission.[2] As such, significant attention has been focused on means of reducing SSIs and their associated morbidity and excess health care costs. Gram-positive microorganisms are the most common cause of SSI following spine surgery.[3] The use of prophylactic intrawound vancomycin powder has recently become a more common practice due to its ease of application, low cost, and ability to achieve high local concentrations with low systemic levels.[4,5] A recent meta-analysis found that vancomycin powder was associated with a significant reduction in SSI (odds ratio: 0.19, 95% confidence interval: 0.09–0.38).[6] Furthermore, cost analyses on patients undergoing lumbar fusion procedures have demonstrated that the use of vancomycin powder was associated with a cost savings of $438,165 per 100 spinal fusions performed.[7]

As with any new technology, medication, or technique, adverse events and/or sequelae will inevitably surface following generalized practice implementation. Well-described adverse drug reactions to systemic intravenous vancomycin use include red man syndrome, vasculitis, anaphylaxis, ototoxicity, nephrotoxicity, neutropenia, thrombocytopenia, fever, phlebitis, and Stevens–Johnson syndrome.[8] The authors of the current study report a case of persistent/recurrent sterile seroma formation following multilevel lumbar decompression and fusion. The authors postulate that this persistent fluid collection may have been secondary to the application of intrawound vancomycin powder in a mechanism mediated through a hypersensitivity reaction.

Because topical vancomycin powder does not result in persistently elevated serum or local vancomycin levels,[4,5] we feel it would unlikely be the principal underlying factor leading to a persistent/recurrent seroma collection. In the current case report, the authors describe that the seroma needed to be drained a total of nine times from 1 to approximately 4 months postoperatively. By this time, the local and serum levels of vancomycin would be essentially nonexistent; as such, we feel this reaction and fluid formation would more likely be the result of a permanent implant (pedicle screw, rod, interbody graft, etc.) that resulted in a persistent allergic response. This is supported by the fact that hypersensitivity reactions have been reported for implanted metals, including titanium and stainless steel, which are common elements of spinal hardware systems.[9,10] However, given the current data of this case, it is impossible to definitively state the underlying culprit for the persistent, recurrent seroma collection.

Nevertheless, it should be emphasized that all medications carry risks of adverse reactions. Open and transparent reporting of these adverse events, with analysis to determine causality, is critical as any new treatment is implemented by the masses. Application of intrawound vancomycin should occur in a thoughtful and evidence-based manner, reserving for those at risk of SSI. At our institution, we currently employ vancomycin powder (up to 2 g) in patients undergoing open posterior spinal fusion procedures or those with multiple risk factors for infection. We do not routinely use vancomycin powder in patients undergoing minimally invasive procedures (decompression alone or fusion), discectomy, or single-

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level open decompression procedures. In this way, we have attempted to optimize the benefits versus risks associated with this prophylactic treatment strategy. We look forward to further research in this area to enhance our understanding on ways of further preventing SSIs.

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