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Editorial

The Silent Epidemic: Surgical Site Infections and Antimicrobial Resistance

Jawaid Naeem Qureshi
Department of Surgey, Indus Medical College, Tando Muhammad Khan, Pakistan

Correspondence:
Jawaid Naeem Qureshi, Department of Surgery, Indus Medical College, Tando Muhammad Khan, Pakistan
Email:
drjnq@hotmail.com
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ABSTRACT:
Surgical Site Infections (SSIs) remain one of the most common and costly complications of surgery. Despite decades of advances in surgical safety, infection prevention, and antimicrobial therapy, they continue to undermine outcomes, particularly in low- and middle-income countries. The growing shadow of antimicrobial resistance (AMR) has only made this challenge more difficult, turning once-manageable infections into life-threatening conditions. This editorial reflects on the burden of SSIs, the ways AMR is reshaping their management, and the urgent steps needed, including but not limited to stronger prevention, smarter antibiotic use, and global collaboration, to protect the future of safe surgery.

Keywords: surgical site infection, antimicrobial resistance, Surgery, Patient Safety, Infection Control

INTRODUCTION

Every surgeon, regardless of experience, carries the quiet fear of infection after an otherwise successful surgical procedure. A clean incision, carefully closed, can still become a source of prolonged morbidity and longer hospital stay. This paradox that surgery can both heal and harm, is nowhere more evident than in the persistence of surgical site infections (SSIs). Globally, SSIs account for a large proportion of hospital-acquired infections. In some hospitals specially in low-resource settings, as many as one in three surgical patients will develop infection at surgical site. Even in well-equipped centers, SSIs continue to trouble patients and surgeons alike. The rise in antimicrobial resistance (AMR) has reshaped this old problem, making it harder to treat and, in some cases, nearly impossible to control. An SSI does not just extend a hospital stay; but it changes a patient's life trajectory. Families face unexpected costs, patients often lose weeks or months of productivity, and in resource-limited countries, even a minor postoperative infection can drain savings and force difficult financial decisions. For hospitals, the impact is equally harsh. A single infection can mean multiple reoperations, extended antibiotic courses, and longer intensive care stays. Globally, billions of dollars are lost each year to infections that, with the right systems in place, could have been prevented. The burden is not evenly shared—patients in low- and middle-income countries pay from their own source in most places.

When antibiotics first became available, they transformed surgical practice. Suddenly, the great fear of sepsis after an operation was no longer inevitable. Now that dramatic change in surgical outcome is changing due to high rate of AMR. Resistant organisms such as MRSA, ESBL-producing Enterobacteriaceae, carbapenem-resistant Gram-negatives are not a rare finding. They are found in operating theaters across the world. This brings a huge challenge to the surgeons that the very antibiotics they rely on to prevent and treat SSIs are also increasingly becoming resistant. Surgeons often feel compelled to extend prophylaxis, fearing infection, but on that works as a two way sword on one end they are trying to prevent infection but on other end, they may unintentionally fuel resistance. The cycle needs a watchfull consideration, otherwise it risks taking us back to an era where even routine operations carried major risks of infection related morbidity and mortality during post-operative period.

Despite global guidelines, SSIs remain stubbornly common. In many hospitals, basic infection control measures are still unreliable, instruments may be reused with inadequate sterilization, operating rooms are overcrowded, and hand hygiene compliance is inconsistent. Antibiotics, sometimes used as substitutes for inadequate infection prevention, are overprescribed and continued long after surgery.

Another challenge is the surveillance. In many regions, SSIs are underreported or not tracked at all. Without reliable data, policymakers and clinicians cannot see the true scale of the problem. The result is an invisible epidemic, underappreciated until it claims lives.

Charting a Way Forward

Solving the problem of SSIs in the age of AMR requires more than surgical skill—it demands system-wide change:

1. Fundamental corrections: Safe water, reliable sterilization, strict hand hygiene, and adherence to surgical safety checklists need to be made mandatory for even minor surgical procedures.
2. Careful use of antibiotics: Short, targeted prophylaxis must replace prolonged, indiscriminate use. Local resistance data should guide practice, and stewardship programs should involve surgeons, microbiologists, and pharmacists working together.
3. Better surveillance: Hospitals and national systems must track infections honestly and consistently. Only then can progress be measured.
4. Investment in infrastructure and system delivery: Low- and middle-income countries need support to strengthen infrastructure, supply chains, and training in infection prevention.
5. Innovation: From antimicrobial sutures to AI-driven wound monitoring, new tools are emerging that can complement traditional infection control strategies.

The persistence of SSIs in 2025 is not simply a failure of surgery but it is a failure of systems. Patients place extraordinary trust in their surgeons, believing an operation will bring relief, not more suffering. That trust is eroded when preventable infections occur.
The way forward requires global solidarity. SSIs should not be accepted as inevitable, nor should AMR be allowed to dictate the future of surgery. If we can commit to stronger prevention, wiser use of antibiotics, and honest measurement of outcomes, we can turn this tide.

CONCLUSION

Surgical site infections are as old as surgery itself, but in an age of modern medicine, they should not remain among the most common complications. The added burden of antimicrobial resistance makes them one of the most urgent challenges of global health. The scalpel, once empowered by antibiotics, now risks becoming blunt in the face of resistant microbes. It is up to us—as clinicians, researchers, and policymakers—to ensure that safe surgery remains a reality for all

Conflict of Interest

Author declare no conflict of interest.