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Surgical site infection prevention: A bundle approach focusing on skin

Surgical site infections (SSIs) represent a significant challenge in postoperative care, contributing to increased morbidity, extended hospital stays, and elevated healthcare costs. Special care should be taken when the patient and/or the incision and operation carries high risk. A bundle approach that integrates multiple preventive measures has been shown to reduce the incidence of SSIs effectively. This review examines the efficacy of several preventive measures focusing on skin: durable antimicrobial skin preparation, antimicrobial incise drape and closed incision negative pressure therapy.

Iodine povacrylex is an effective and durable anti-infective skin preparation solution containing iodine and alcohol, provides a rapid and sustained antiseptic effect on the surgical site, significantly reducing microbial counts on the skin and provides a resistance to irrigating fluids and blood. Iodophor impregnated adhesives drapes immobilize and isolate residual bacteria on the skin, helping to prevent migration into the surgical incision area. Foam dressing based closed incision negative pressure wound therapy (ciNPT) system, is applied postoperatively to reduce lateral tension, reduce edema, improve lymphatic flow and perfusion, and provide an effective barrier to help reduce the risk of surgical site complications.

The integration of these three preventive measures for selected patients into a single SSI prevention bundle might provide a marked reduction in infection rates across various surgical disciplines. Although there is no specific evidence for such bundle, it can be hypothesized that the combination of such skin focused bundle might improve the outcome.

This review highlights the potential synergistic effects of durable anti-infective skin preparation solutions, antimicrobial incise drapes and ciNPT in a bundled approach, emphasizing their role in creating a comprehensive and effective strategy for SSI prevention. The findings underscore the importance of adopting such multi-modal strategies to improve surgical outcomes and patient safety, though further studies are needed to confirm this hypothesis.

Risk Factors for Surgical Site Infections

Patient Related Risk Factors

- | | | | |
|---|--|---|--|
| <ul style="list-style-type: none"> Diabetes mellitus ASA Score ≥3 Advanced age | <ul style="list-style-type: none"> Obesity Active tobacco use Hypoalbuminemia | <ul style="list-style-type: none"> Corticosteroid usage Active alcoholism Male sex | <ul style="list-style-type: none"> Hematoma Chronic renal insufficiency Chronic obstructive pulmonary disease |
|---|--|---|--|

General Incision Related Risk Factor

- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> High tension incision Repeated incisions Extensive undermining | <ul style="list-style-type: none"> Traumatized soft tissue Oedema Contamination | <ul style="list-style-type: none"> Emergency procedure Prolonged operation time Post surgical radiation | <ul style="list-style-type: none"> Mechanically unfavorable site |
|--|--|--|---|

Procedure Related Risk Factor

- | General | Plastic | Orthopedic | Vascular | Cardiovascular |
|---|---|--|--|--|
| <ul style="list-style-type: none"> Open general Open colorectal Open urology Open obgyn Incisional hernia repair | <ul style="list-style-type: none"> Post bariatric abdominoplasty Breast reconstruction Big soft tissue defects Soilage risk | <ul style="list-style-type: none"> Open reduction and internal fixation of fractures Fasciotomy AKA/BKA | <ul style="list-style-type: none"> AKA/BKA Synthetic graft implant | <ul style="list-style-type: none"> Sternotomy |

Figure 1: Essential risk factors for surgical site infection categorized into patient related, incision related and procedure related.

Biography

Levent Adnan Afsar is a senior medical science liaison in Solvatum Healthcare. He has graduated from Istanbul University, Faculty of Medicine. He completed ear nose throat head and neck surgery residency in Taksim State Hospital, Istanbul. He worked in Pfizer and Merck & Co. in CNS, Neurology, CVS. He has an executive MBA degree from Bilgi University-Manchester Business school. He worked in Medipol University Vatan Clinics as an ENT surgeon. In 2016 He joined Acelity as senior regional medical manager responsible for CEE region. In 2020, he was appointed as a scientific affairs and education manager/medical science liaison responsible for EMEA in Medical Solutions Division in 3M. He has several publications on pain and the musculoskeletal system and he is a member of Turkish Otorhinolaryngology Head and Neck Surgery Society and Turkish Fascial Plastic Surgery Society.

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