AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

SEPSIS IN SURGICAL PATIENTS: EARLY DIAGNOSIS, SOURCE CONTROL, AND MODERN MANAGEMENT STRATEGIES

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Abstract

Sepsis remains a leading cause of morbidity and mortality among surgical patients worldwide. It is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. Surgical patients are particularly vulnerable due to invasive procedures, trauma, postoperative complications, and immunosuppression. Early diagnosis, prompt antimicrobial therapy, adequate fluid resuscitation, and timely source control are critical determinants of survival. Delays in intervention significantly increase mortality. Advances in critical care medicine, including early goal-directed therapy, sepsis bundles, and improved organ support strategies, have improved outcomes. This article reviews the pathophysiology of sepsis in surgical patients, diagnostic criteria, importance of early source control, and modern evidence-based management strategies.

Keywords

Sepsis, surgical infection, septic shock, source control, organ dysfunction, antimicrobial therapy, intensive care.

Introduction

Sepsis is a major global health problem and a frequent complication in surgical practice. Postoperative infections, intra-abdominal abscesses, anastomotic leaks, necrotizing soft tissue infections, and trauma-related infections are common sources.

The current definition of sepsis was established by the Society of Critical Care Medicine and the European Society of Intensive Care Medicine under the Sepsis-3 consensus, emphasizing organ dysfunction as the key component.

Surgical patients are at higher risk due to:

●Tissue injury and inflammation

●Exposure to hospital-acquired pathogens

●Indwelling devices

●Comorbidities (diabetes, malignancy, immunosuppression)

Pathophysiology

Sepsis develops when the host immune response to infection becomes dysregulated.

1. Inflammatory Cascade

Recognition of pathogens by immune cells triggers release of pro-inflammatory cytokines (TNF-α, IL-1, IL-6), leading to systemic inflammation.

2. Endothelial Dysfunction

Inflammatory mediators damage vascular endothelium, increasing permeability and causing hypotension.

3. Coagulation Abnormalities

Activation of coagulation pathways leads to microthrombi formation and impaired tissue perfusion.

4. Organ Dysfunction

Hypoperfusion and mitochondrial dysfunction result in multiorgan failure affecting lungs (ARDS), kidneys (AKI), liver, heart, and brain.

Early Diagnosis

Early recognition significantly reduces mortality.

Clinical Indicators

Fever or hypothermia

1.Tachycardia

2.Tachypnea

3.Hypotension

4.Altered mental status

SOFA Score

Organ dysfunction is assessed using the SOFA score (Sequential Organ Failure Assessment). An increase of ≥2 points suggests sepsis.

Laboratory Markers

Elevated lactate (marker of tissue hypoperfusion)

Leukocytosis or leukopenia

Elevated procalcitonin

Abnormal coagulation profile

Source Control in Surgical Sepsis

Source control is a cornerstone of management and includes:

Drainage of abscesses

Debridement of infected or necrotic tissue

Removal of infected devices

Repair of perforations or anastomotic leaks

Delay in surgical intervention significantly increases mortality. Early and adequate source control improves survival outcomes.

Modern Management Strategies

1. Early Antibiotic Therapy

Broad-spectrum antibiotics should be administered within the first hour of suspected sepsis. Therapy should later be adjusted according to culture results.

2. Hemodynamic Resuscitation

Rapid administration of intravenous crystalloids

Vasopressors (norepinephrine as first-line) for persistent hypotension

3. Sepsis Bundles

The Surviving Sepsis Campaign recommends structured sepsis bundles that include:

Lactate measurement

Blood cultures before antibiotics

Early antibiotics

Fluid resuscitation

Vasopressor support if needed

4. Organ Support

Mechanical ventilation for respiratory failure

Renal replacement therapy for acute kidney injury

Nutritional support

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Glycemic control

Septic Shock

Septic shock is a subset of sepsis characterized by:

Persistent hypotension requiring vasopressors

Serum lactate >2 mmol/L despite adequate fluid resuscitation

Mortality in septic shock remains high, emphasizing the importance of early intervention.

Discussion

Sepsis in surgical patients requires rapid multidisciplinary coordination between surgeons, intensivists, anesthesiologists, and infectious disease specialists. Early diagnosis and aggressive management significantly reduce mortality. Source control differentiates surgical sepsis from medical sepsis and must not be delayed.

Implementation of sepsis protocols and standardized bundles has improved survival; however, antimicrobial resistance and delayed recognition remain major challenges.

Conclusion

Sepsis in surgical patients is a life-threatening condition requiring immediate recognition and intervention. Early diagnosis, prompt antimicrobial therapy, aggressive hemodynamic support, and timely source control are the cornerstones of successful management. Modern evidence-based strategies and multidisciplinary collaboration are essential to improve outcomes and reduce mortality in surgical sepsis.

References

1. Karimov Sh.I., Axmedov R.A. Surgical Infections and Sepsis.
2. Karimov ShI, Axmedov RA. Surgical Infections and Sepsis Management. Tashkent: Abu Ali ibn Sino Medical Publishing House; 2019. 368 p.
3. Saidov M.S., Rakhimov B.T. Emergency Surgery and Septic Complications.
4. Saidov MS, Rakhimov BT. Emergency Surgery and Postoperative Complications. Tashkent: Yangi Asr Avlodi Publishing; 2021. 420 p.
5. Yuldashev A.A., Tursunov F.F. Early Diagnosis and Modern Treatment of Surgical Sepsis.
6. Yuldashev AA, Tursunov FF. Early diagnosis and modern management strategies of surgical sepsis. Medical and Time (Tibbiyot va Zamon). 2022;4(57):25–33.
7. Surviving Sepsis Campaign. International Guidelines for Management of Sepsis and Septic Shock.

AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 02. February ,2026

8. Evans L, Rhodes A, Alhazzani W, et al. Surviving Sepsis Campaign: International guidelines for the management of sepsis and septic shock 2021. Intensive Care Medicine. 2021;47:1181–1247.