Septic Abdomen: Diagnosis and Effective Management

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Septic peritonitis represents a life-threatening condition requiring rapid diagnosis and timely intervention. Despite advances in critical care, morbidity and mortality remain significant. This is a short summary of current concepts in the classification, diagnosis, and management of septic abdomen, emphasizing the importance of early fluid analysis, hemodynamic stabilization, and effective source control.

Introduction

Septic peritonitis is defined as bacterial inflammation of the peritoneum, while abdominal sepsis follows the Sepsis-3 definition as an increase in SOFA score of ≥2 due to intra-abdominal infection. The condition is commonly encountered in veterinary emergency and critical care and requires a multimodal diagnostic and therapeutic approach.

Classification

Septic peritonitis is categorized into three types:

- **Primary peritonitis**: spontaneous infection without an identifiable intra-abdominal source, often associated with hematogenous or lymphatic spread.
- **Secondary peritonitis**: the most common form, resulting from intra-abdominal pathology, particularly gastrointestinal perforation or leakage.
- **Tertiary peritonitis**: persistent or recurrent infection following treatment of secondary peritonitis.

Clinical Presentation

Clinical signs are often non-specific and include lethargy, fever, abdominal pain, vomiting, diarrhea, and signs of shock. Assessment of systemic inflammatory response syndrome (SIRS) criteria is essential. A degenerative left shift has been associated with increased mortality.

Diagnostic Approach

Diagnosis relies on a combination of clinical suspicion, imaging, and laboratory testing.

Imaging:
AFAST is a rapid and reliable method to detect free abdominal fluid. Ultrasound is useful for fluid sampling and localization of pathology but has limited sensitivity for certain lesions, such as gallbladder rupture.

Fluid Analysis:
Abdominal fluid analysis remains the most valuable diagnostic tool. Septic effusions are typically

characterized by high cellularity and protein content. The presence of intracellular bacteria is diagnostic. Biochemical markers, including a blood-to-fluid glucose difference (>20 mg/dL) and elevated fluid lactate compared to blood (>2.5 mmol/L), support the diagnosis but are not universally reliable.

Biomarkers
Lactate has shown good discriminatory ability between septic and non-septic effusions, although its interpretation is limited by multiple sources of production. Procalcitonin rises rapidly in response to bacterial infection and correlates with disease severity. Hypoalbuminemia is common and reflects both disease severity and systemic protein loss.

Microbiology
The gastrointestinal tract is the primary source of infection, with bacterial populations increasing in density and diversity in the more distal intestinal tract. Infections involving Gram-negative and anaerobic bacteria are associated with higher mortality and increased risk of septic shock.

Treatment

Management is based on four key principles:

1. **Hemodynamic stabilization:**
   Crystalloid fluid therapy is the first-line treatment, administered in boluses with frequent reassessment. Not all patients with septic peritonitis present in septic shock.
2. **Antimicrobial therapy:**
   Broad-spectrum antibiotics should be initiated early and adjusted based on culture results.
3. **Source control:**
   Effective source control is critical and includes debridement, removal of infected material, drainage, and decompression. Inadequate source control significantly increases mortality. Surgical approaches may include damage-control strategies and staged procedures.
4. **Organ support:**
   Vasopressors such as norepinephrine are used to maintain mean arterial pressure ≥65 mmHg. Blood product administration is guided by clinical parameters.

Prognosis
Reported survival rates range from approximately 44% to 75%. Prognostic indicators include hypotension, organ dysfunction, hypoalbuminemia, and postoperative complications. Gastrointestinal origin is most common, and recurrence occurs in approximately 10% of cases.

Conclusion
Septic peritonitis remains a critical condition with non-specific clinical presentation. Early diagnosis, particularly through fluid analysis, combined with prompt stabilization and effective source control, is essential for improving outcomes. A multidisciplinary approach and careful monitoring of prognostic indicators are key to successful management.