

Radiologic Evaluation and Management of Postoperative Spine Paraspinal Fluid Collections

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KEYWORDS

• Postoperative spine • Seroma • Hematoma • Pseudomeningocele • Abscess

KEY POINTS

- Paraspinal fluid collections are often seen after spine surgery. This increased frequency is likely due to surgical manipulation, but may also reflect other factors such as the extent of the spine surgery, patient comorbidities, and patient coagulation status.
- Postoperative imaging modalities include myelography, ultrasound, radionuclide scanning, computed tomographic scan, and magnetic resonance imaging. Magnetic resonance imaging remains the best study to visualize and define the spectrum of paraspinal fluid collections.
- Management of paraspinal fluid collections is challenging. Communication between the radiologist and surgeon is extremely helpful in managing these complex situations.

INTRODUCTION

The high prevalence of back and/or neck pain in the United States population is estimated at 20%.¹ A large number of these patients initially or eventually undergo spinal surgery. Approximately 1.2 million spine surgeries, including 300,000 spinal fusion surgeries, are performed each year in the United States.² It is always important to try to understand why an operative intervention was performed. The indications for spine surgery include deformity correction for congenital scoliosis, relief of neural compression from space-occupying lesions such as disc herniation, osteophyte formation, epidural mass or hematoma, relief of spinal canal stenosis due to degenerative or infectious spine disease, or correction of spinal instability.³ This information may be helpful in understanding why a potential complication occurs.

For example, an analysis of non-neurologic complications following spinal surgery for adolescent idiopathic scoliosis in 702 patients showed that hematoma, seroma, and dehiscence occurred in 0.71% of the surgeries. These latter complications were associated with increased blood loss and prolonged operative and anesthesia times.⁴ In addition, knowledge of the specific type of spinal surgery, whether it is deconstructive such as a laminectomy for spinal stenosis or reconstructive such as a fusion for instability, can be helpful in the search for abnormal paraspinal fluid collections. The radiologist should be familiar with the types of surgical approaches, tools, implants, and techniques associated with spine surgeries as this will assist in identifying focal abnormalities. Approaches may consist of anterior, posterior, or combined anterior-posterior and may use

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instrumentation such as screws, spinal wires, artificial ligaments, vertebral cages, artificial discs, and osteoinductive agents.⁵ Different spine fusion techniques are associated with different complications and complication rates.⁶

Although most spine surgeries are successful, complications may be observed. Postoperative spine paraspinal fluid collections are not uncommon. They may or may not be symptomatic, but their presence, either as an incidental finding or as a possible etiologic agent in the postoperative patient's clinical presentation, requires careful evaluation and management. Given their frequent occurrence, they have received limited attention in the medical literature, yet often pose a diagnostic dilemma for both surgeon and radiologist alike. The purpose of this article is to describe the various types of paraspinal postoperative fluid collections with respect to their imaging findings,

to characterize them, and to suggest possible management strategies.

Different types of fluid collections may be encountered within or about the spinal axis following spine surgery. Fortunately, the overwhelming majority of these collections are self-limited and resolve with conservative management. There are those paraspinal fluid collections, however, that are found on postoperative spine imaging evaluation in symptomatic patients that may require further diagnostic evaluation, such as percutaneous aspiration, or additional surgical intervention such as open decompression and/or medical management with prolonged antibiotic therapy (Fig. 1). The fluid collections may be classified by location, intra-spinal or within the epidural compartment, or paraspinal, that is anterior, dorsal, or lateral to the spinal axis. These collections may also be classified by type and

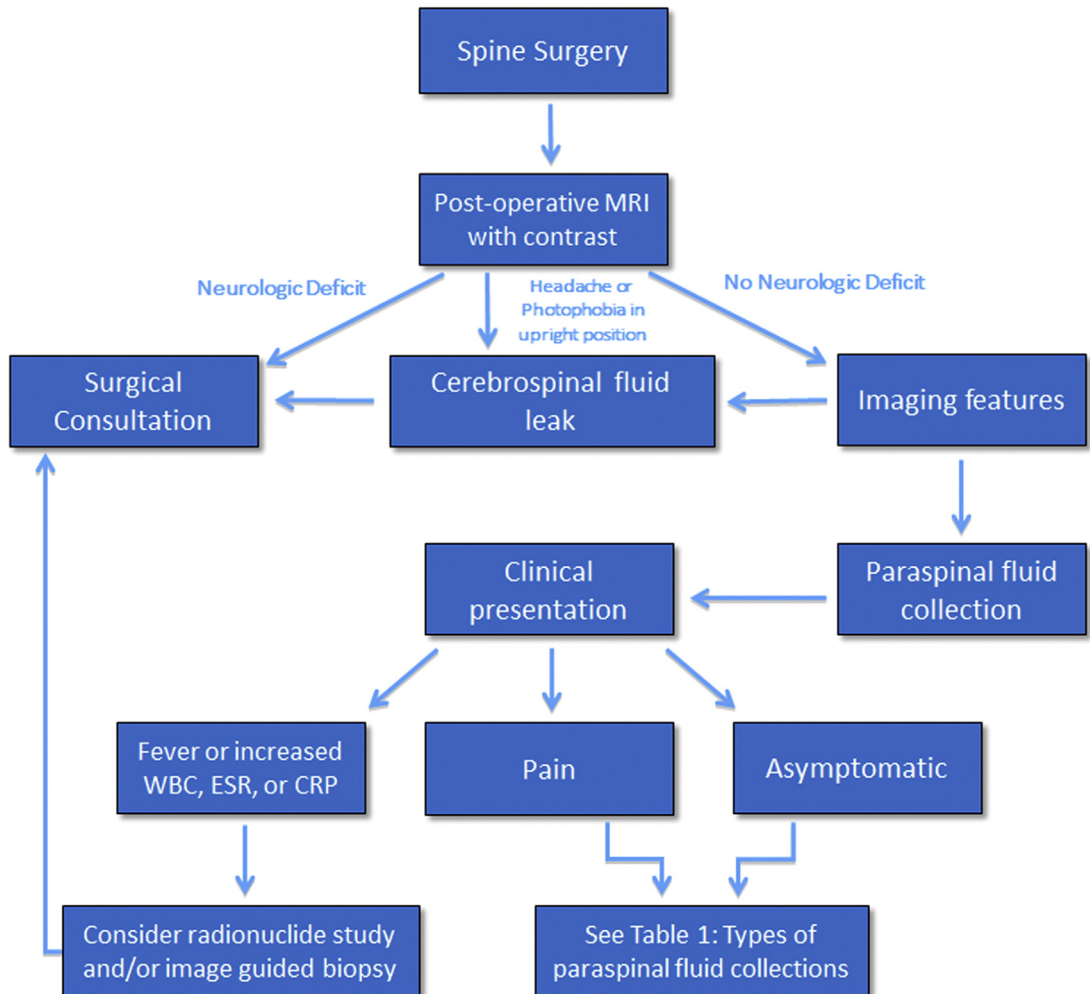


Fig. 1. Diagnostic algorithm for management of postoperative spine paraspinal fluid collections. CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; WBC, white blood cell count.

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