CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 20 (2016) 33–36

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Spinal epidural abscess following glossectomy and neck dissection: A case report

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ARTICLE INFO

Article history:
Received 17 October 2015
Received in revised form 4 January 2016
Accepted 4 January 2016
Available online 12 January 2016

Keywords:
Spinal epidural abscess
Glossectomy
Neck dissection
Klebsiella pneumonia

ABSTRACT

INTRODUCTION: Spinal epidural abscess is an uncommon but potentially life threatening entity that rarely occurs after otolaryngology procedures.
PRESENTATION OF CASE: We report a case of a diabetic patient who presented with a lumbar spinal epidural abscess eight days after head and neck oncologic surgery. Magnetic resonance imaging revealed an L4 spinal epidural abscess. Cultures from the spinal epidural abscess, blood, urine, and the previous neck incision grew *Klebsiella pneumoniae*. The patient recovered neurologic function after surgical decompression and drainage, long-term intravenous antibiotics, and physical therapy.
DISCUSSION: The development of postoperative spinal epidural abscess is rare after otolaryngology procedures but has been reported in the cervical epidural space. To our knowledge, lumbar spinal epidural abscess has not yet been reported after head and neck oncologic surgery. Even more unique is the presence of the pathogen *K. pneumoniae*.
CONCLUSION: A high index of suspicion of this potential outcome is paramount as early recognition and intervention are keys to recovery of neurologic function.

1. Introduction

Spinal epidural abscess is a rare but potentially life threatening condition. The incidence has increased in recent years due to an aging population and increased incidence of risk factors such as diabetes mellitus, chronic immunosuppression, and intravenous drug abuse [1–4]. The pathogenesis of spinal epidural abscess is most commonly hematogenous spread [2]. *Staphylococcus aureus* is the leading pathogen, while *Klebsiella pneumoniae* is extremely rare [1–4]. There are only few reported cases of spinal epidural abscess after head and neck surgery, none of which involve *K. pneumoniae*. We report a case of *K. pneumoniae* lumbar spinal epidural abscess in an 80-year-old diabetic patient after head and neck cancer surgery.

2. Case presentation

An 80-year-old female with a history of diabetes mellitus, coronary artery disease, and gastroesophageal reflux disease presented to clinic with a T1N0M0 invasive moderately differentiated squamous cell carcinoma of the right lateral oral tongue. This lesion was biopsied in clinic approximately two and a half weeks prior to surgical intervention. She was taken to the operating room for an uneventful right partial glossectomy and right modified radical neck dissection levels I–III with preoperative administration of metronidazole and clindamycin. She was discharged on postoperative day three. The patient was voiding spontaneously without issue throughout her admission. Of note, neither Foley nor epidural catheters were placed. The patient was predominantly bed bound after discharge due to pain and was reportedly incontinent of urine.

The patient presented to the emergency department on postoperative day eight with neck pain, erythema, edema, and drainage. She was afebrile but with a leukocytosis to 19,300/μL. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were 77 mm/h and 25.1 mg/dL respectively. The previous neck incision was opened and drained with immediate return of 40 mL of purulent material. Culture was positive for *K. pneumoniae*.

The patient also complained of low back pain and bilateral lower extremity pain and paresthesias. Her exam was significant for nonspecific spinal tenderness, mild right upper extremity weakness (4/5), mild distal left lower extremity weakness (4−/5), and left-sided sensory deficits. Neurosurgery was consulted, and imaging was obtained. Magnetic resonance imaging (MRI) of the lumbar spine demonstrated an L4 posterior lumbar epidural abscess in addition to myelitis extending from lumbar nerve roots up to T9 (Fig. 1). She was taken emergently to the operating room for L3–L5 laminectomies and evacuation of epidural abscess and phlegmon. Cultures from blood, urine, and the epidural abscess were positive for *K. pneumoniae* as well. The patient was treated with a

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http://dx.doi.org/10.1016/j.ijscr.2016.01.004

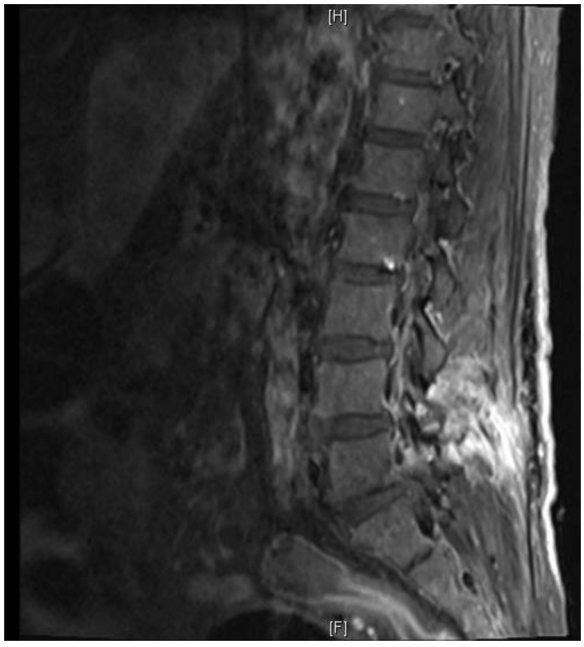

Fig. 1. This is a sagittal T1 post-contrast MRI demonstrating enhancement and a well-defined pocket of fluid signal intensity in the posterior aspect of the spinal canal at the mid L4 level.

6-week course of intravenous ceftriaxone (2 g every 24 h) and was eventually discharged to a skilled nursing facility for additional rehabilitation and treatment. At her one-month postoperative visit, the patient reported subjective improvement in bilateral lower extremity pain, paresthesias, and strength. Her exam revealed trace right upper extremity weakness (4+/5), mild distal left lower extremity weakness, and no sensory deficits. In addition, resolution of the abscess was noted on repeat MRI.

3. Discussion

The reported incidence of spinal epidural abscess is 0.2–2.8 cases per 10,000 hospital admissions per year with a peak incidence in the seventh and eighth decades of life [1]. Predisposing conditions include advanced age, underlying disease (diabetes mellitus, alcoholism, infection with human immunodeficiency virus, intravenous drug abuse, morbid obesity), spinal abnormality or intervention, or potential local or systemic source of infection (urinary tract infection, skin and soft tissue infection, osteomyelitis, indwelling vascular access, or epidural anesthesia) [2]. The reported incidence of diabetes mellitus in patients with spinal epidural abscess ranges from 15% to 53.7% [3–6]. Bacterial entrance into the epidural space is through contiguous spread (one third of cases), hematogenous (half of cases), or an unknown source [2]. The genitourinary tract tends to be the most common site of origin (17%) in hematogenously spread spinal epidural abscesses with infectious endocarditis (12%), skin and soft tissue (11%), and the oral cavity (2%) being less common sites [7]. The most common pathogen described in spinal infections is *S. aureus* [1,2,4,5]. Gram-negative bacteria are the third leading cause of spinal infections, with *K. pneumoniae* being responsible for only 1% of spinal epidural abscesses [4,7].

K. pneumoniae infections are typically acquired in the hospital setting, accounting for 3–8% of nosocomial bacterial infections [8]. The most common manifestations are urinary tract infection, pneumonia, and primary bacteremia. Similar to spinal epidural abscess, risk factors for infection with *K. pneumoniae* include diabetes mellitus, malignancy, immunosuppression, and alcoholism [9,10]. Lee et al. reviewed 101 patients with *Klebsiella* bacteremia and found associated diabetes mellitus in 36% of patients and malignancy in 26% of patients [10]. *K. pneumoniae* may also be manifested in deep neck space infections, although more infrequently than other pathogens [11]. The isolation of *K. pneumoniae* from spinal epidural abscesses is quite uncommon.

Diagnosis of spinal epidural abscess can be achieved with a combination of clinical findings, laboratory studies, and imaging. Fever, back pain, and neurologic deficits are the most common clinical findings [1,2,4,5,12]. The presenting symptoms may mimic other more common conditions, which may lead to incorrect diagnosis in a reported 74% of cases [13]. Various laboratory findings including leukocytosis and an accelerated ESR have been suggestive of ongoing inflammatory processes in the spine in conjunction with the aforementioned signs and symptoms [4,5]. Rigamonti et al. noted leukocytosis and an elevated ESR in 60% and 95% of 75 cases of spinal epidural abscess respectively. MRI remains the reference standard for diagnosing spinal epidural abscess while computed tomography myelography is the choice if MRI is either unavailable or contraindicated. Surgical decompression and drainage in conjunction with systemic antibiotics is the first line treatment [2,14]. Exceptions to this recommendation include poor surgical candidacy due to medical comorbidities, complete paraplegia lasting greater than 24–36 h, extensive spinal involvement prohibiting surgery, and few to absent neurologic signs or symptoms [2,14]. Management in these cases includes intravenous antibiotics for a minimum of 6 weeks with frequent neurologic examinations and serial MRIs [2,4].

There are few reported cases of cervical epidural abscess after tonsillectomy, esophagoscopy, and esophageal dilation [12,14,15] (Table 1). Time to diagnosis of cervical epidural abscess ranged from 3 to 6 weeks, whereas the patient described in this case report was diagnosed with a lumbar epidural abscess just over one week postoperatively. It should be noted that this patient was diabetic and of older age, while none of the three previously described patients had diabetes mellitus or other known immunocompromising conditions. Iatrogenic esophageal perforation was thought to be the etiology for abscess formation in both patients undergoing esophagoscopy and esophageal dilation. All of the above patients required surgical debridement and a minimum 6-week course of intravenous antibiotics.

Our patient developed a *K. pneumoniae* spinal epidural abscess most likely from hematogenous spread as evidenced by *K. pneumoniae* bacteremia. Potential origins of the infection include the genitourinary tract and soft tissue infection at the surgical site, with cultures from both demonstrating growth with *K. pneumoniae*. Factors that may have contributed to this postoperative outcome include patient age, diabetes mellitus, and malignancy. The aim of this case report is to heighten awareness of this potential clinical presentation after head and neck surgery, as early diagnosis and intervention are keys to the recovery of neurologic function.

4. Conclusion

Spinal epidural abscess is an extremely rare outcome after head and neck surgery. The diagnosis is challenging as the initial symptoms may mimic other more common conditions. The combination of back pain with associated fevers and neurologic deficits in addition to leukocytosis and elevated ESR should raise suspicion in patients who have recently undergone head and neck surgery, especially in those with risk factors like diabetes mellitus.

Conflicts of interest

There are no conflicts of interest to disclose.