Transoral negative-pressure catheter drainage of a retropharyngeal and mediastinal abscess

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Abstract

Purpose: A retropharyngeal abscess (RPA) is an extremely rare entity in adults that has a tendency to spread vertically and cause a mediastinal abscess. Traditionally, immediate aggressive drainage is recommended via a transcervical or transthoracic approach for the treatment of a retropharyngeal abscess with mediastinal extension. Here, we present a case of a retropharyngeal and mediastinal abscess using a transoral negative-pressure catheter drainage approach.

Patients and methods: A 24-year-old woman was admitted with a 4-day history of severe sore throat and painful swallowing. Computed tomography identified a retropharyngeal abscess extending to the upper posterior mediastinum. We performed transoral negative-pressure catheter drainage.

Results: The postoperative course was uneventful. The patient reported a rapid improvement in symptoms and had a good tolerance of the catheters in the nasal cavity. At 2 years postoperatively, physical examinations revealed no recurrence or surgical complications.

Conclusions: Transoral negative-pressure catheter drainage is a minimally invasive operation for the treatment of RPA in adults with or without a mediastinal abscess. This method could be recommended as an alternative approach in such cases.

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1. Introduction

A retropharyngeal abscess (RPA) is an infection deep within the neck. This uncommon clinical entity occurs more frequently in children and is usually described as a pediatric disease [1,2]. Only 51 RPA cases in adults were described in the literature between 1970 and 1995 [3]. Medical therapy for RPA in children and adults, without surgical drainage, has been supported by several reports [4–6]. However, surgical intervention can be reserved for patients whose clinical conditions do not improve with medical therapy alone. The majority of these RPA cases can be managed transorally. In adults, the literature has suggested that a much more aggressive transcervical surgical approach is likely necessary [7,8]. In recent years, Ultrasound and CT scanning-guided drainage have been proposed as alternatives to open surgical incisions for the placement of needles or indwelling catheters into these abscesses [9–12].

Anatomically, the retropharyngeal space extends from the base of the skull into the mediastinum, up to the T2 thoracic vertebral level. The RPA has a tendency to develop mediastinal abscesses, an affliction with high mortality rates [13].
Surgical managements vary in mediastinal abscesses, but they can include transcervical approaches, median sternotomy, and video-assisted or mediastinoscopically assisted drainage [14,15]. Although conventional invasive procedures have been recommended by many investigators, such approaches may lead to unexpected results, such as massive tissue injury, osteomyelitis, dehiscence of the sternum, and other complications. Percutaneous drainage has been reported as an alternative, minimally invasive operation with excellent results [16].

In cases of retropharyngeal abscess with posterior upper mediastinal extension, some authors have advocated a cervicotomy and transcervical mediastinal or video-assisted thoracic surgery (VATS) drainage [14]. Although less traumatic than traditional mediastinal drainage, a cervicotomy is still a high-risk approach because of the complicated anatomy of the neck.

Negative-pressure drainage has been used in head and neck surgeries for several years to remove body fluids, thereby preventing the accumulation of serous fluid and improving wound healing [17,18]. There have been few reports in the literature of the application of this technique to deep neck infections. We present a case of a retropharyngeal and mediastinal abscess caused by neck trauma to a healthy, young patient who had a successful outcome with the transoral approach and continuous negative-pressure catheter drainage. We discuss this minimally invasive surgical technique in the context of therapies for retropharyngeal and mediastinal abscesses.

2. Case report

A 24-year-old woman was admitted with the clinical diagnosis of a retropharyngeal and mediastinal abscess. Her history revealed that, 10 days prior to her admission, she had been wounded on the right side of her neck by a knife. Surgical debridement and sutures were performed in another hospital. She received a 2-day intravenous therapy (cefazolin sodium) to prevent infections. No detailed information was available about the condition of the trauma. According to her, the sore throat started 4 days before admission with a temperature of 38.7 ºC and rapidly worsened. Despite her prescription of intravenous cefazolin sodium and successfully controlling her temperature to the normal level, her symptoms of sore throat dysphagia were not improved. She was referred to our hospital. Upon examination, her neck movements were markedly restricted by pain. The oral examination showed a marked edema in the posterior pharyngeal wall mucosa. The bilateral tonsils appeared normal. Her blood tests on admission revealed leukocytosis of 12.23 × 10^9 cells/L, but there were no systemic toxic signs. An urgent CT scan of the neck and chest demonstrated a large, hypodense lesion extending from the base of the skull into the upper posterior mediastinum, with the greatest transverse diameter of 6.4 cm (Figs. 1 and 2). Gas formation was also revealed in the center of the hypodense area. A transoral needle aspiration examination in the posterior pharyngeal wall demonstrated yellowy, purulent material, and the pus sample was sent for microbiology. She was given a diagnosis of retropharyngeal and mediastinal abscess.

The patient was taken to the operating room, where she underwent transoral drainage of the abscess under orotracheal intubation general anesthesia. A horizontal incision, 1.5 cm in length, was made in the posterior pharyngeal wall. A substantial amount of purulent liquid overflowed from the incision. Two catheters were carefully advanced into the abscess cavity, over 12 cm in depth. Saline was pumped in through one catheter while fluid was sucked out from the other until the liquid appeared clear. The distal ends of the two
mediastinitis or mediastinal abscess, a potentially life-threatening complication.

RPA are the most common deep neck abscesses in children. Only 51 RPA cases in adults were reported in the literature between 1970 and 1995 [3]. Whenever these abscesses are diagnosed, systemic antimicrobial therapy should be administered. However, it remains controversial whether early drainage should be performed. Traditionally, prompt early surgical incision and drainage have been recommended. In recent years, the medical therapy of RPA in children, without or with limited surgical drainage, has been supported by pediatric otolaryngologists [5,20–22]. RPA may be successfully treated with antibiotics alone in certain select cases. A trial of IV antibiotics does not adversely affect outcomes and may negate the need for surgery, particularly among patients with smaller abscesses. However, surgical interventions should be reserved for patients whose clinical conditions do not improve on medical therapy.

Drainage of the retropharyngeal space can be accomplished through an intraoral or extraoral approach. The majority of RPA incidences can be managed transorally. In patients with large retropharyngeal space abscesses, an external aggressive surgical approach may also be needed [22,23].

A trend toward less aggressive surgical approaches has been described by some authors in regards to the surgical treatment of deep neck infections; such techniques include percutaneous needle aspiration and catheter-assisted drainage. As alternatives to surgical operations, those strategies are less invasive than conventional open surgery and produce similar outcomes [24–28].

RPA in adults is usually contained only by fascial space, with little preventing its spread in a vertical direction [13]. Mediastinal abscesses can occur in uncontrolled cases and constitute a rare but life-threatening infection [14]. Historically, immediate aggressive drainage is recommended via a transcervical or transthoracic approach [29,30]. In 1984, Gobien et al. [31] described a series of 12 patients with mediastinal abscesses, of whom six underwent a successful percutaneous drainage. Since then, several reports have been written regarding the use of percutaneous image-guided drainage in the management of mediastinal abscesses [32,33]. In 2011, Arellano [16] reported a series of 23 patients with mediastinal abscesses over a 10-year period and demonstrated that percutaneous CT-guided percutaneous abscess drainage is associated with high technical and clinical success rates. This minimally invasive form of therapy may have a role in the management of patients with potentially life-threatening mediastinal abscesses.

Drains are commonly used after surgical procedures. Active drains using negative-pressure wound therapy can remove the accumulated fluid from a wound and create a non-gravity-dependent gradient at the egress port. This technique has been demonstrated to be an efficacious option to promote healing in a variety of acute and chronic complex wounds [34]. This technique was originally applied to mediastinal infections in 1989 [35]. However, its use for the management of cervical infections has not been widely studied [36]. To the best of our knowledge, no use of negative pressure has been previously described in the management of a retropharyngeal abscess with mediastinal involvement.

Figure 3 – A horizontal incision, 1.5 cm in length, was made in the posterior pharyngeal wall. Two catheters were advanced into the abscess cavity. The distal ends of the two catheters were driven from the posterior naris to the external naris.
In our patient, based on catheter drainage and negative-pressure therapy, we adopted intraoral catheter continuous negative-pressure drainage in the treatment of the large retropharyngeal abscess with mediastinal extension. This access is a minimally invasive operation that is able to avoid the traumatic transcervical or transthoracic approaches. Furthermore, continuous negative-pressure drainage avoids gravitational fluid accumulation while preventing the further spread of infection. Washing dressing daily can dilute the secretions, maintaining smooth drainage. In addition, the patient had a good tolerance to the drainage tube being removed through the nose.

Our approach achieved the intended goal of managing the retropharyngeal and mediastinal abscess. However, there is still a need for improvement. Computed tomography-guided drainage could be helpful in positioning the tube and guaranteeing its security. A postoperative CT examination is also necessary. Unfortunately, the patient in our report refused this examination.

Additionally, when draining the large retropharyngeal abscess intraorally, it is recommended to aspirate the area of induration or fluctuance to confirm the presence of pus and not blood. Once the presence of pus is confirmed, an incision can be made over the mass. For the larger tension abscess, a sudden overflow of a large amount of pus may cause asphyxia and aspiration; such operations call for great caution. Anesthetic intubation should be performed gently to avoid rupturing the abscess. An appropriate puncture decreases this risk before incision. Proper patient selection is also necessary. This transoral approach is a visual operation. The RPA must maintain a higher anatomical level in the posterior pharyngeal wall. In the case of a RPA with lateral extension, a cervicotomy is recommended.

These observations based on our experience with this patient indicate that transoral negative-pressure catheter drainage bears several advantages for the treatment of RPA in adults, with or without a mediastinal extension, over traditional open surgery. This method could be recommended as an alternative approach in such cases.

REFERENCES


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