A Rare Case of Cervical Epidural Abscess Post Posterior Cervical Laminotomy with Isolation of Neisseria Meningitides Bacteria

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Abstract

Spinal epidural abscess is a rare condition, although it requires an urgent surgery to decrease the pressure on the epidural sac in addition to the other structures of the spinal cannel cord and nerve roots.

A 29 years old female entered the clinic with large neck swelling. She also had a history of headache with neck pain, both arm paresthesia with mild fever. Her MRI showed an epidural collection at level of cervical 5 to cervical 7 compressing the dural sac narrowing the spinal cannel and extending to the paraspinal intramuscular area in the neck.

She had undergone a surgery with a 2cm mid line incision above the swelling mass in order to suck out the pus. In addition, the intermittent Valsalva maneuver was performed to enhance the epidural pus gat out. The culture and sensitivity test to pus indicated a Neisseria meningitides bacterial growth. Penicillin G and cefotaxime as antibiotics were prescribed. Improvement occurred within 2 weeks.

Although rare, the isolated Neisseria meningitides spinal epidural abscess requires an urgent treatment through evacuating and decompressing. Spondylodiscitis or collapse may occur, therefore, a surgery for spine correction may be needed, fellow up is recommended in all forms of epidural abscesses.

Key words: *Neisseria meningitides bacteria, cervical spine, spinal epidural abscess*

Introduction of the Case

A 29-year-old female entered the clinic suffering from severe neck pain, head ache, paresthesia, myelopathy of both arms and a history of posterior cervical laminotomy for cervical 5 to cervical 6 before 11 months. Her MRI revealed an intramuscular cyst containing pus and 2 pieces of foreign body in the large neck swelling of 6 X 3 cm diameter. Its size was 5.5cm long X 1.5mm width of epidural abscess at level of cervical 5 to cervical 7 vertebral body on the right side.

On examination, she seemed confused, uncomfortable and pale. Her pulse rate was 100 beats per minute, respiratory rate 16 cycle, blood pressure 100/70, temperature 37.9^{O}C.

Methods

Musculoskeletal examination

Musculoskeletal examination showed a large posterior cervical tender mass, with painful neck movement and there was no stiffness and head ache.

Neurological examination

The examination showed that the patient had a paresthesia over the RT, LT shoulder and upper limb predominantly RT side.

Motor examination

Motor examination was conducted on the patient. This examination revealed the followings:

RT side

1. Shoulder grade 2
2. Wrist flexion and extension both grade 2
3. Elbow flexion grade 3, extension grade 2

LT side

1. All examination of grade 4
2. Reflexes
3. Diminished elbow and wrist reflex

Result

Laboratory findings

The patient had also underdone laboratory examinations showing the followings:

1. White blood cell count (WBC) of 4,631 cells/ul
2. Neutrophils sedimentation 56%
3. Lymphocyte 26%
4. Monocyte 15%
5. Hemoglobin level is 11.7 g/dL
6. Platelet is 476, cell/ul
7. Glucose concentration of 129 mg/dL
8. C-reactive protein (CRP) 2.77mg/dL (normal range <0.5 mg/dL)

MRI FINDING

The MRI findings showed a large intramuscular cystic pus of 6 x 3 cm diameter containing two suspicious bodies. In addition, the epidural pus collection extended from cervical 5 to cervical 7 of 5 cm long X 1.5 width (figure 1).

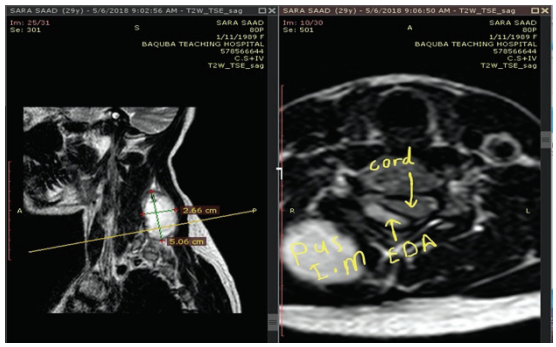

Figure 1, a large oval cyst intramuscular, and epidural abscess compressed spinal cord

Procedure

Under general anesthesia, prone position, amid line 1.5 cm long skin incision was made over the cyst at cervical 5 level. In addition, the paraspinal muscle was separated and the cyst wall was incised. All the pus was evacuated removing the 2 foreign particles (resulted from solidification of wax inserted in the previous operation) as figures 1,2 and 3 show. The anesthesiologist performed irrigation and suction with normal saline and an Appling intermitting Valsalva maneuver to increase the dural and vascular pressure. The pressure forces the epidural pus go out through previous laminotomy window (figure 2). This means that there was no need for another laminectomy. When clear fluid of irrigation was seen. A 350 ml ready vac drains were inserted (kept for 2 days) and the pus sent for lab examination. Intravenous antibiotics started during the operation including cefotaxime 1g by 2 pulse amikacin 1g by one a day. The result showed Neisseria meningitides bacteria, as a result, the antibiotics was changed to penicillin G and cefotaxime for 10 days post-operative. The patient remained 3 days at the hospital after the operation.

picture 1

picture 2

picture 3

Picture 1, color of pus, picture 2,3 a harden bone wax from previous operation (grasped by artery forcipes)

Figure 2, laminotomy site from previous operation

Sample Results

The colonies that grow on the Macconky and chocolate agar media are circular, convex, entire, opaque, shiny, smooth. They were positive for oxidase and catalase. The gram stain was used to investigate the shape of the bacteria and the stain was gram negative diplococcus bacteria that confirm the species is Neisseria meningitidis.

Out come and follow up

Anti-Neisseria antibiotics started by only changing amikacin to penicillin (ceftriaxone 1g injection plus penicillin 1.2 mega I.U intravenous injection for 10 days).

Postoperatively, gradual improvement occurred in both upper limbs. At one month follow up, both upper limbs showed a complete motor recovery (grad 5). MRI was conducted 6 months post-surgery showing an abscess complete resolution and the spinal cord had well decompressed (figure 3).

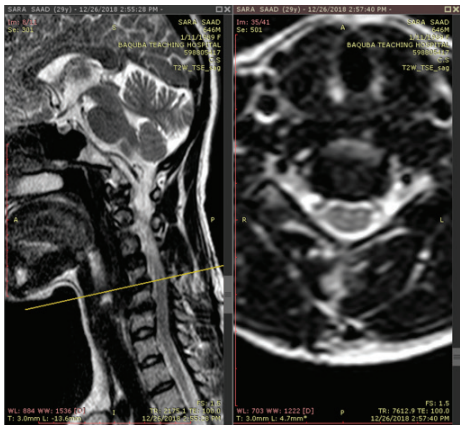

Figure 3, a complete resolution of abscess

Discussion

The reason of the disease of invasive meningococcal is Neisseria meningitidis which is a very quickly progressive sepsis syndrome. It could be non-classically presented as epiglottitis, septic arthritis, pneumonia and pericarditis.

The N. meningitidis clone is caused by a single introduction event. In Victoria, this event undergoes an extensive endemic transmission[1, 2].

In the case report paper, the patient was 78-year-old female patient presented to emergency department. She had a throat pain 5-day and hoarseness. She also had a dolorous and progressive submandibular swelling for the same period.

A neck CT scan with intravenous contrast has been performed for her. The scan displayed an acute epiglottitis typical thumbprint sign. In minutes, her health conditions deteriorated. The patient was near the respiratory exhaustion. The primary sample of blood cultures showed Neisseria meningitidis bacteremia. Then, the treatment of the patient was successful[3].

Another case was a 44-year-old woman. She suffered from rhinitis and sore throat. These two illnesses developed to dysphagia, neck swelling, dyspnea at night. Therefore, she was required to sleep sitting upright with dramatic external cervical swelling because of cellulitis. The blood cultures showed Neisseria meningitides positive[4]. In many countries such as the USA, Colombia, Sweden, Norway, Finland and Venezuela, the cases with N. meningitidis have risen over the previous 20 years [5].

For Neisseria meningitides, the natural habitat and reservoir are the human nasopharynx. Nasopharyngeal mucus components specifically bind the meningococci that cause cytotoxicity. This cytotoxicity breaks down the tight junctions of epithelial cells which slough the ciliated cells and ciliostasis. The most vital components that mediate between initial meningococci attachment and non- ciliated epithelial cells of the human nasopharynx are pili. The meningococci occupy the epithelial surface in order to arrive at the submucosa in different routes. Although meningococci are divergent, they have become successful. It is the mechanisms that infect the nasopharynx in humans [6]. The vital element to activate the classical pathway of component

is the fourth complement component (cervical 4). It is a key defense that protects from the activities of microorganisms. The total risen cervical 4 deficiency cases were in patients suffering from Neisseria meningitidis infection, Haemophilus influenzae or Streptococcus pneumoniae[7]. N. meningitidis could be defined as a strict human pathogen. With endothelial cells, this pathogen could interact very firmly. Type IV pili mediate meningococcus adhesion for the induction of a sub cortical cytoskeleton localized remodeling. This forms endothelial membrane protrusions anchoring bacterial colonies at the endothelial cell membrane face of endoluminal. This helps to better resist the flow of blood. In the recent studies, the ability of N. meningitidis to recruit the polarity complex Par3/Par6/aPKC has been reported. This re-routs the adhesion molecules of endothelial cell of interendothelial junctions which open a paracellular route for bacteria to pass the endothelial barrier [8].

Conclusion

Isolated Neisseria meningitidis spinal epidural abscess is an infrequent illness. However, it requires an urgent treatment through evacuation and decompression. Some signs of spondylitis or spondylodiscitis could exist later. Thus, a long follow-up is suggested for N.meningitidis patients with this type of abscess.

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