

CASE REPORT: A RARE CASE OF HERPES ZOSTER WITH TRIGEMINAL AND VESTIBULOCOCHLEAR NERVES INVOLVEMENT

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ABSTRACT

BACKGROUND: The distinguishing characteristic of Herpes Zoster (shingles) is its limitation to a single dermatome. The involvement of more than one dermatome is unusual, while the involvement of more than one spinal nerve is a rare find. The case presented is a 70-year-old woman with herpes zoster of two cranial nerves: the trigeminal and the vestibulocochlear; the three divisions of the trigeminal nerve were also involved.

METHODS: A 70-year-old woman who complained of a week old history of blisters on the face and mouth and three (3) weeks history of toothache on the left side is presented. The patient also complained of ringing, pain in the left ear, and rotational dizziness. She admitted that she was treated for malaria fever a week before the onset of these symptoms. On examination, there were ulcers involving the skin of the left side of the face up to the left auricle and the scalp. The left maxillary and mandibular mucous membrane and left side of the tongue also had ulcers. There was no facial muscle weakness. Laboratory investigation included Full Blood Count, fasting blood sugar (FBS), and retroviral screening (RVS). The FBS was within normal limits, while RVS was non-reactive. Treatment was with oral prednisone -dosage tapered-; antibiotics, and diazepam.

RESULTS: Healed erosions were observed on the 3rd week of treatment.

CONCLUSION: Multiple dermatome distribution of vesicular rash due to more than one spinal nerve involvement is an uncommon finding in herpes zoster. Early diagnosis and prompt treatment can result in complete resolution.

KEYWORDS: herpes zoster, varicella-zoster virus, multiple dermatomes, trigeminal and vestibulocochlear nerves.

INTRODUCTION

Typically the rash of shingles, also known as herpes zoster infection, occurs in a single, wide stripe either on the left or right side of the body or face¹ and is characterized by a painful skin rash with blisters in a localized area.²

It is limited to a dermatome (an area of skin that is mainly supplied by a single spinal nerve.1) and does not cross the midline.³

Oral involvement may occur alone or in combination with a rash on the skin over the cutaneous distribution of the same trigeminal branch.⁴

The causative agent for shingles is the varicella-zoster virus (VZV) – a double-stranded DNA virus that belongs to the Herpes group of viruses. Most individuals are infected with this virus as children, at which time it would have caused an episode of chickenpox. The immune system eventually eliminates the virus from most locations, but it remains dormant (or latent) in the ganglia adjacent to the spinal cord (called the dorsal root ganglion) or the trigeminal ganglion in the base of the skull.⁵

Detection of VZV antigen by direct fluorescent antibody staining of a smear of VZV DNA by polymerase chain reaction (PCR) or culture helps confirm the diagnosis.⁶ PCR is considered the most reliable diagnostic method.⁷ The diagnosis of shingles is typically based on clinical features;⁸ however, herpes simplex virus can occasionally produce a rash in such a pattern (zosteriform herpes simplex) as shingles.⁹

When the rash is absent (early or late in the disease, or in the case of zoster sine herpette), shingles can be difficult to diagnose.¹⁰

Treatment aims to limit the severity and duration of pain; shorten the duration of the shingles episode, and reduce complications.

A case of a 70-year-old woman with multiple dermatomes and spinal nerves involvement of herpes zoster infection is presented.

Ethical approval was from the Edo State Ministry of Health. The patient's consent was sought before clinical photographs were taken, she consented when it was explained to her that it would be used to monitor the progress of the condition and for the education of others concerning this unusual condition.

CASE PRESENTATION:

A 70-year-old woman presented to the oral surgery clinic with a complaint of blisters on her face and mouth on the left side; ringing and pain with fluid discharge from the left ear; and dizziness whenever she turned to her side, all of a week duration. The blisters had earlier presented as fluid-filled rashes, then broke down to form ulcers. The patient then applied gentian violet (GV) to dry up the ulcers on the skin of the face.

In addition, the patient complained of toothache on the left side of the lower jaw for three weeks duration.

The patient was managed for malaria fever a week before the appearance of the rashes.

She had no medical history of diabetes mellitus or hypertension. The patient admitted to having had chickenpox as a child at about seven (7) years of age but admitted no lingering scars on the skin.

There was no facial muscle weakness on extraoral examination as determined by the House-Brackmann¹¹ classification. The patient was graded 1. There were

crusted ulcers involving the skin of the face and side of the head up to the auricle (including the beginning of the external auditory meatus), the scalp, and the tip of the nose. Additionally, there were crusted ulcers on the skin of the chin, all on the left side (figure 1a).

The crusted ulcers of the face, including the auricle, were all covered with GV.

Intraoral examination showed ulcers on the mucous membrane of the palate (hard and soft); palatal and labio-buccal mucosa of the maxilla; lingual and labio-buccal mucosa of the mandible; and the mucosa of the lateral tongue, all on the left side (Figures 1b-d). Most of the lesions in figures 1b-d are ulcerations and not blisters (small bubbles on skin or mucosa filled with fluid)

Grossly carious lesions were observed on teeth numbers. ^{23,24,27 and 34,35, 36} However, they were not tender to percussion.

INVESTIGATION: RVS (retroviral screening): non-reactive; Blood sugar level: 87mg/dl (range: 80-120mg/dl); Blood pressure: 120/70mmHg; Malaria parasite: negative; Full Blood Count: Hematocrit 11%; Packed Cell Volume 32%; white Blood Cell count 9,100/mm³. The differentials were: Neutrophil 43%, Lymphocyte 46%, Monocyte, Eosinophil and Basophil 11%.

A clinical diagnosis of Shingles was made, and the patient was counseled and treated as follows:

- Oral diclofenac 50mg 12 hourly for 1week with food; paracetamol 1000mg 8hourly for 3days;
- Prednisone 30mg daily in a divided dose of 10mg 8hourly for the 1st week, 15mg in a divided dose of 5mg 8hourly for the 2nd week, and 7.5mg in a divided dose of 2.5mg 8hourly for the 3rd week for the pain and the ulcers.
- In addition, diazepam 5mg at night for 5days for the complaint of vertigo and tinnitus;
- Empirical amoxicillin 500mg /metronidazole 200mg 8 hourly for five days.
- Gentamicin ear drops 2-3 drops daily for four days were prescribed for the purulent discharge from the ear.

The patient was referred to the ENT surgeon and Ophthalmologist. The patient was reviewed after three days. She reported that she did not visit the ENT surgeon and the Ophthalmologist because she felt there was no need. She was further reviewed weekly for three weeks (figures 2a and 2b) and monthly for three months according to the standard set in our clinic for reviews.

The patient was seen on the 6th month after her first presentation, and she did not report any adverse effects such as pain which would have raised the suspicion of postherpetic neuralgia. It was observed that there was marked resolution of the ulcers with patches of fading scars on her chin and in front of the tragus of the ear.

DISCUSSION:

The significance of this case presented is that it involved two spinal nerves: the trigeminal (the fifth cranial nerve) and the vestibulocochlear (the eighth cranial nerve) nerves. Additionally, the three divisions of the trigeminal nerves were involved, as indicated in figure 1a. Some authors^{12,13} have described the involvement of the three divisions of the trigeminal nerve and this case presented adds to the growing body of knowledge.

Shingles cause skin changes limited to a dermatome and does not cross the midline.³ Symptoms that follow a dermatome (e.g., pain or a rash) may indicate a pathology that involves the related nerve root.¹⁴

One of the presenting complaints by this patient was toothache. Carious lesions were observed in the left maxillary and mandibular jaws to support this complaint. It has been observed that the prodromal pain (before the rash) may be confused with toothache,⁴ and sometimes this leads to unnecessary dental treatment.¹⁵

The patient had treated herself for malaria fever a week before the onset of rashes. The earliest symptoms of shingles, which include headache, fever, and malaise, are nonspecific and may result in an incorrect diagnosis.¹⁶ In our environment, it is believed that the commonest cause of fever is malaria.^{17,18}

The patient's complaint of dizziness when she turns to the side (rotational dizziness), ringing in the ear (tinnitus), and ear pain could be attributed to the involvement of the eighth cranial nerve – the vestibulocochlear nerve –, shingles oticus, also known as Ramsay Hunt syndrome type II, involves the ear.¹⁹ It is thought to result from the virus spreading from the facial nerve to the vestibulocochlear nerve.¹⁹ Symptoms include hearing loss and vertigo (rotational dizziness).¹⁹

Shingles of the trigeminal nerve is expressed according to the dermatome distribution.

It may occur in the oral cavity if the maxillary or mandibular division of the trigeminal nerve is affected.⁴ The rash may appear on the mucous membrane of the upper jaw (usually the palate, sometimes the gingiva of the upper teeth) or the lower jaw (tongue or gingiva of the lower teeth).¹⁵

In this case, presented, the mucosa of the maxilla – including the hard and the soft palate - and the mandible, in addition to the mucosa of the dorsum and lateral part of the tongue (innervated by the mandibular branch of the trigeminal nerve) were all affected on the left side. In addition, the skin overlying the cheek, the nares, upper lip (maxillary division) and lower lip, chin, and jaw (except the angle of the mandible), on the side of the head above the ear, external ear, external auditory meatus, (mandibular division) were affected.²⁰

Significantly, it has been noted by some writers that the maxillary and mandibular divisions of the trigeminal nerve were rarely involved.²¹ Additionally, there are no skin manifestations except oral mucosal involvement when the maxillary division is involved in herpes zoster.²⁰ The rash observed on the tip of the patient's nose (figure 1a as indicated by the point of the arrow) is a strong predictor of herpes ophthalmicus.²²



Figure 1a: the three divisions of the trigeminal nerve: crusted ulcers on the face, chin, cheek, ear, and lateral head (L). The arrow is pointing to the blister on the tip of the nose (which confirms the ophthalmic division of the trigeminal nerve).



Figure 1b



Figure 1c



Figure 1d

Figures 1b-1d: intraoral crusted ulcers including the tongue (maxillary and mandibular divisions of the trigeminal nerves intraoral).

The Ophthalmic nerve has three branches, one of which is the nasociliary nerve. One of the terminal branches of the nasociliary nerve is the anterior ethmoidal nerve which divides into a lateral nasal branch and a medial nasal branch. After giving off sensory branches to the anterior and upper parts of the nasal septum, the medial nasal branch emerges from beneath the inferior nasal margin to form the external nasal nerve. The external nasal nerve provides sensory innervation to the skin of the external nose to the tip²³

The frequency of zoster in the trigeminal nerve, including ophthalmic is 15%.6 and the ophthalmic branch is affected

about 20 times more often than 2nd and 3rd branches of nerve²¹ more publications to support above The relative frequency of ophthalmic herpes zoster increases with age²⁴ due to the reduced immunity that occurs with increasing age. This patient was a 70-year-old woman, and increasing age is one of the risk factors for herpes zoster.¹³

Diagnosis of herpes zoster infection is made typically based on a patient's clinical signs and symptoms⁸ characterized by a painful skin rash with blisters in a localized area,² limited to a dermatome and does not cross the midline.³

Risk factors for reactivation of VZV within a person's body include old age and poor immune function, and having had chickenpox before 18 months of age.¹ This patient recalled suffering from chickenpox at the age of seven. Treatment aimed to limit the severity and duration of pain, shorten the duration of a shingles episode, and reduce complications.

Paracetamol, NSAIDs, or opioids may be used to help with the acute pain.⁸ Diazepam was given for the complaint of vertigo and tinnitus; empirical amoxicillin and metronidazole were added due to concerns about bacterial superinfection.²⁵ The use of systemic steroids in this patient was to reduce the incidence of long-term neurological sequelae as advocated by some clinicians, although there is currently no meta-analysis to support such in the literature.²⁶

Gentamicin ear drops 2-3 drops daily for four(4) days were prescribed for the ear's purulent discharge.

Healing of the ulcers was observed when the patient visited on the 3rd week of follow-up. Others have noted that the rash usually heals within two to four weeks.²



Figure 2a



Figure 2b

Figures 2a and 2b: 3 weeks review.

Figure 2a: extraoral healing ulcers. Figure 2b: intraoral healing ulcers.

CONCLUSION:

Multiple dermatome distribution of vesicular rash due to more than one spinal nerve involvement is an uncommon finding in herpes zoster. Early diagnosis and prompt treatment can result in complete resolution.

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