Facial Nerve Paralysis Due to Intra-aural *Hyalomma* Tick Infestation

Kulak Kanalı İçinde *Hyalomma* Cinsi Kene Isırığına Bağlı Fasiyal Sinir Paralizi

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ABSTRACT

We present the case of a 33 year-old man from a village of the north-eastern part of central Anatolia admitted to the otolaryngology department of Yeditepe University Hospital with right facial asymmetry and pain on the right ear. A tick of the genus Hyalomma was observed in the external auditory canal of the right ear and it was removed with fine cup forceps under otomicroscopy. We are of the opinion that in patients presenting with sudden acute ear pain and facial palsy, the ear canal should be examined to exclude an infestation by ticks.
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Key Words: Facial nerve palsy, tick infestation, ear, external auditory canal

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ÖZET

Bu olguda, Orta Anadolu'nun Kuzey-doğu kesiminde bir köyden gelen, yüzünün sağ tarafında asimetrisi bulunan ve sağ kulak ağrısı şikayeti ile Yeditepe Üniversitesi Hastanesi kulak burun boğaz bölümüne başvuran 33 yaşındaki bir erkek hasta sunulmuştur. Hastanın sağ dış kulak yolunda kene gözlenmiş ve kenenin çıkarılması otomikroskopi altında fine cup forceps ile yapılmıştır. Ani başlayan şiddetli kulak ağrısı ve yüz felci ile başvuran endemik bölgeden gelen hastaların, kulak kanalında kene ısırığı olasılığını dışlamak için dikkatlice incelenmesi gerektiği görüşündeyiz.
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Anahtar Sözcükler: Fasiyal sinir paralizi, kene, kulak, dış kulak yolu

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INTRODUCTION

Tick paralysis is a neurological syndrome caused by a potent neurotoxin produced by an attached tick feeding on the host (1). The neurological symptoms may appear immediately after the infestation or progress within days after attachment.

Cases of isolated facial nerve paralysis are less commonly reported (2-5). Usually, the palsy is present at the time of tick detection, and, in the case of facial-nerve palsy, the tick is noticed most often behind the ear or within the external auditory meatus. The recovery usually begins soon after tick removal. Cases of isolated facial palsy may last three days to three weeks (3, 4, 6). If unnoticed, the tick may remain attached, leading to death as a result of respiratory paralysis. Since a delay in the diagnosis may have devastating consequences, physicians must be aware of the basic features of this syndrome.

The bite of some ticks, mainly from the Ornithodoros genus, may lead to local lesions and systemic illness, referred to as tick toxicosis (7). Toxicoses caused by toxic substances secreted by the salivary glands of ticks include: tick paralysis (neurotropic toxin), sweating sickness (dermotropic toxin), and Rhipicephalus appendiculatus toxicosis (leukotropic toxin).

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Approximately 40 species of soft (argasid) and hard (ixodid) ticks secrete salivary toxins that cause paralysis in humans and some animals (8). Tick paralysis is thought to be caused by a toxin secreted in tick saliva during feeding that reduces motor neuron action potentials and the action of acetylcholine, depending on the species of tick.

Several theories may explain the pathophysiology of localised facial nerve palsy in an intra-aural tick infestation. It is likely that a presence of a perforation in the tympanic membrane enables the tick saliva with the toxin to enter the middle ear and reach the facial nerve, probably through a natural dehiscence of the fallopian canal, causing paralysis (9).

Many clinicians may be unfamiliar to this clinical entity; although they are relatively rare, cases of tick paralysis are known from the literature. Tick paralysis has been frequently misdiagnosed, and this envenomation syndrome must be included in the differential diagnoses of any patient presenting with an ascending symmetric paralysis.

Cases with facial paralysis reported to date are mainly due to *Dermacentor* sp. and *Ixodes* spp. because of the geographical distribution of ticks (1-6, 10).

Ticks of the genera Haemaphysalis, Hyalomma, Boophilus, Dermacentor, and Rhipicephalus are widespread throughout Anatolia. Therefore, tick-borne diseases and tick-paralysis are expected to be related to these genera (11). Likewise, Gurbuz et al. (12) and Edussuriya et al. (13) reported tick facial paralysis cases with *Hyalomma* species.

In this report, we present a case of a peripheral facial nerve paralysis which was developed due to a tick of the genus Hyalomma being attached to the external auditory canal.

CASE REPORT

A 33 year-old male patient who lives in the north-eastern part of the Central Anatolia was admitted to the Department of Otolaryngology of the Yeditepe University Hospital. The patient had right facial asymmetry and right ear pain, which had been continuing for ten days. From his detailed history, he noted that his first complaint was a sudden pain in the right ear and not having the ability to close his right eyelid the following day. He also noticed a tingling sensation in his face. There was no history of fever, vomiting, diarrhoea, rash, headache, blurred vision, shortness of breath, cough or respiratory distress.

He was admitted to a local hospital with these complaints and he was diagnosed as 'Bell's palsy'; medical treatment was initiated, including methyl-prednisolone (1 mg/kg/day). After 5 days, since there was no progression in his symptoms, he was admitted to our department. Upon physical examination, the patient was afebrile, alert and cooperative and his vital signs were normal. The neurological examination showed that he was able to close his right eyelid with minimal effort, but he had a continued weakness on the right half of his face while smiling and whistling (puffing up the cheeks), and a slight asymmetry on his face could be observed after a big effort (House-Brackmann score II) (Figure 1).

The right external auditory canal was filled with cerumen, which was removed; at this moment a tick on the posterior edge of tympanic annulus was observed at the entrance of the external auditory canal (Figure 2). The tick was partially engorged and was removed with the help of a fine cup forceps under otomicroscopy without damaging it. After the tick removal, the external auditory canal and the tympanic membrane was examined and, with the exception of a redness at the tick attachment site, no abnormalities were noted. The tick was placed in 70% alcohol and was identified as *Hyalomma* sp. During the examination of the excised tick, it was determined that it belonged to genus *Hyalomma* spp. It was sent to a parasitology laboratory of a regional veterinary hospital, but further identification was not performed. Also, microbiological and molecular examinations to reveal the possession of viruses or bacteria could not be performed.

The laboratory test results, including complete blood cell count, erythrocyte sedimentation rate, chemistry profiles and urinalysis,

Figure 1. Endoscopic view obtained through a 0 degree telescope demonstrating the right peripheral facial paralysis (H-B Grade II) of the patient

Figure 2. *Genus Hyalomma* spp. tick on the posterior edge of tympanic annulus

were within normal limits. In addition, the patient had no nausea, vomiting, diarrhoea, conjunctival haemorrhage, murmur or cough. No haemorrhagic symptoms such as epistaxis, haematemesis or melena were detected.

DISCUSSION

Tick paralysis has been reported in Australia, North America, Asia and South Africa. In Europe, paralysis cases are relatively rare. Cases of apparent tick toxicosis in humans caused by *Ixodes redikorzevi* were reported in northern Israel (14, 15).

Most of the reported cases of tick paralysis have been caused by either *Dermacentor andersonii* or *Dermacentor variabilis* in the United States (16, 17). In Australia, cases of paralysis caused by the species *Ixodes holocyclus* have been reported. Children aged 1-5 years are most commonly affected, and the tick is usually found in the scalp, often behind the ear (18). In endemic areas, Lyme disease must also be included in the differential diagnosis of acute facial paralysis. Nigrovic et al. (19) identified 313 patients with peripheral facial palsy who were evaluated for Lyme disease. Of these, 106 (34%) had Lyme disease facial palsy.

In Turkey, few cases of tick paralysis have been reported. Gurbuz et al. (12) reported the case of a 3 year-old girl with facial palsy, which was caused by *Hyalomma marginatum marginatum*. Engin et al. (20) described a tick paralysis with atypical presentation with involvement of the upper trunk of brachial plexus. In their case, the tick was not identified.

Although reports of isolated facial paralysis cases due to tick infestation in the ear are rare in the literature, Bell's palsy and Lyme neuroborreliosis are the two most common diagnoses in patients with peripheral facial palsy in areas endemic for *Borrelia burgdorferi* (5, 9, 12, 21, 22). The development of isolated facial paralysis due to ticks can be explained by several theories obtained from animal studies. In tick paralysis, the neurotoxin slows nerve conduction velocity and the amplitude of muscle action potentials inhibits terminal-nerve conduction and acetylcholine release at the pre-synaptic neuromuscular junctions of muscle fibres, and causes total blockade of transmission at myoneural junctions (23-27).

Isolated peripheral nerve palsy may occur simultaneously with tick attachment (5). Following the removal of the tick, the facial palsy improves within hours. In some studies, it has been reported that recovery may be seen in days or weeks (5, 28).

In the differential diagnosis of isolated facial nerve palsy in patients, the involvement of a tick toxicosis should be taken into account. As most of these ticks are also vectors of human and animal diseases, e.g. *Hyalomma* ticks for CCHF) virus, concomitant examinations should be performed to also exclude an infection with viruses and protozoa.

In the literature, many methods of tick removal have been recommended, including traditional methods such as the application of a lighted match, alcohol or petroleum jelly, which are not effective and contra-productive as the salivating tick could more easily infect the host with the pathogenic microorganisms carried in the their saliva (29). Rapidly killing the tick using a pyrethrin-based insecticidal spray or the application of alcohol and local anaesthesia have also been suggested; however they are ineffective (30). Recently, Poirier et al. (1) described how to successfully remove a tick: the tick should be grasped as close to the skin as possible using blunt curved forceps with a gloved hand and then it should be pulled off the skin using a firm steady motion. In our case, the patient came from a region where CCHF prevalence is high; therefore, the tick was removed from the external auditory canal alive under the microscope, so that the possibility of infections carried by ticks to the patient and healthcare personnel was reduced. Although the patient had symptoms for ten days, the tick had enough time to be engorged and release toxins. However, as a general rule and for infection control standards, the tick was removed with caution.

CONCLUSION

In diagnosing tick toxicosis and tick paralysis, a detailed history and physical examination, a high index of suspicion and knowledge of the epidemiology and natural history of tick-borne diseases are essential. We are of the opinion that in patients particularly coming from rural areas with sudden acute ear pain and facial palsy, the ear canal should be examined carefully to exclude the possibility of parasitisation by ticks.

Conflict of Interest

No conflict of interest was declared by the authors.

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Düzeltme / Erratum

Dergimizin "Cilt: 36 Sayı: 3 Eylül 2012" tarihli baskısında yayınlanmış olan "18-45 Yaş Grubu Kadınlarda, Trichomonas vaginalis ve Diğer Mikroorganizmaların Vajinal Akıntı Örneklerinden Mikroskobik Olarak İncelenmesi" isimli yazının yazar kurumları tarafımdan sehven yanlış yazılmıştır. Olması gereken şekli aşağıdaki gibidir. Düzeltir, tüm okuyucularımızdan özür dileriz.

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