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Parotid Gland – A unique habitat for ‘*Trichinella Spiralis*’

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Abstract

Trichinosis (also called Trichinellosis) is a zoonotic infection caused by the larvae of roundworm species *Trichinella spiralis*. The disease is caused by consuming raw or undercooked pork and wild genome infected with the larvae of roundworm species. It is a serious condition prevalent in many regions of the world. The disease commonly involves the gastrointestinal tract and muscle tissue, followed by the central nervous system. The parotid gland, however, is a rare site of this disease. Hence, we present a case of Trichinellosis, involving the parotid gland (a rare site).

Case report: A 32 yr old female presented with painless swelling of the right parotid gland. She was treated initially with antibiotics but showed no improvement. The microscopic examination of FNA aspirated material corresponded to a cystic inflammatory process. The parotid tumor was surgically removed. Histopathological study of the cystic lesion revealed the presence of the parasite *Trichinella spiralis* and hence it was diagnosed as Trichinellosis of the parotid gland.

Keywords: Trichinellosis, parotid gland, parasite

1. Introduction

Trichinella spiralis was first discovered by Philip Vargas, a first year medical student, while conducting a dissection on cadaver. Richard Owen published the paper on parasite and called it *Trichina spiralis*. Joseph Leidy hypothesized that Trichinosis is caused by consuming under cooked pork and in 1857 Rudolph discovered that the cysts had become much bigger than they had been when encysted in the muscle of their formed host. In 1860, Friderich Zenker performed an autopsy on a female servant who had died of Trichinosis. He recognized the parasite, and proposed that the larva reached the muscle through lymphatic system^[1].

Trichinosis is a preventable disease. The single most important causative factor is the consumption of inadequately cooked meat. *Trichinella spiralis* is the most common disease causing nematode. Many more species are implicated in causation of the disease like *T. britovi*, *T. murrelli*, *T. nativa* etc, depending on the different regions of the world^[2].

2. Morphology

Trichinella spiralis is the smallest known nematode parasite of humans. The males measure about 1.4 mm to 1.6 mm in length and the females are twice the size of the males. The body of the worm is more slender at the anterior end than at the posterior. In females the uterus is contained in the posterior portion of the worm and is filled with the developing eggs. The anterior end of the female contains hatching juveniles. This nematode has a cuticle with three or more main outer layers made of collagen and other compounds. The outer layers are non-cellular and are secreted by the epidermis. The cuticle layer protects the nematodes as they invade through digestive tracts of animals. Nematodes have longitudinal muscles along the body wall. The muscles are obliquely arranged in bands. Dorsal, ventral and longitudinal nerve cords are connected to the main body of the muscle^[3].

3. Life cycle

The pigs are the most commonly consumed reservoir hosts throughout the world while humans are incidental hosts. Six days after ingestion, the female worms release large numbers of newborn larvae that penetrate the gut wall, enter the systemic circulation, and

migrate to various tissues especially active striated skeletal muscle groups eg- diaphragm, tongue, and the masticatory, intercostal and pectoral muscles. The larvae burrow into individual muscle fibers, and are transformed into nurse cells in next 3 weeks [4,5].

4. Case report

A 32 year old female came with swelling and redness extending from the angle of the mouth upto the tragus of the ear (Right side) posteriorly. The swelling was gradually increasing in size over a period of 1 month and treated with antibiotics. The swelling was painful to start with, but later on became painless, but not regressed.

On physical examination, the swelling was firm and solid in consistency, measuring 6cm x 5.5 cm in size, located in the parotid region (right side). It was non-tender and mobile. There was no facial nerve involvement. A provisional clinical diagnosis of parotid gland neoplasm was made. There was no palpable lump or swelling anywhere else in the body. Following investigations were performed:

- 1) On ultrasonography a mass, predominantly solid/partly cystic was reported.
- 2) CT scan of the head and neck revealed a round, well-demarcated hypo and hyperdense mass in the parotid gland.
- 3) Fine needle aspiration (FNAC) from the parotid mass was done which revealed an inflammatory process (polymorphs, eosinophils, macrophages and lymphocytes seen) with cystic changes.
- 4) Hematological investigations:
Hb%-11.5gm%, TLC-14,600 cells/cubic mm, DC showed eosinophilia (Eosinophil- 22%), ESR- 36mm at the end of one hour. Bleeding time and clotting time were within normal limits.
- 5) Serological studies : HIV, VDRL, HBsAg were Negative
- 6) Urine microscopy and biochemistry reports were normal.

5. Surgical procedure

Superficial parotidectomy (Right) was carried out under general anesthesia. Per operatively a mass was found, predominantly solid consistency replacing most of the parotid gland. The mass was encapsulated by the parotid parenchymal tissue. The mass and the remains of the parotid gland along with the capsule were excised and sent for histopathological examination.

6. Histopathology Examination

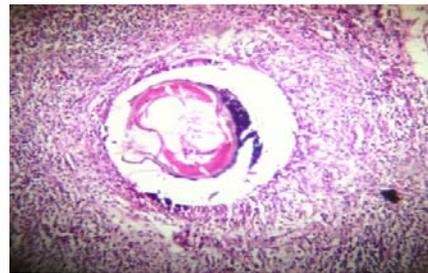
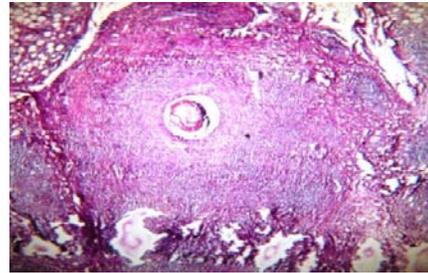
Gross

Parotidectomy specimen measuring 5.5 x 4 x 2 cms. Cut section shows a rim of parotid tissue surrounding the cystic lesion along with areas of haemorrhage.



Microscopy

Sections studied show parotid gland parenchyma with abundant eosinophils, neutrophils, plasma cells and macrophages surrounding the small cyst, which shows an encircled, coiled thread-like worm, along with edematous and necrotic changes. *Trichinella spiralis* larvae were found. A diagnosis of Trichinellosis was made.



7. Discussion

Trichinosis is known to humans for a long time, and spread world-widely. Infestation is initiated by the ingestion of raw or poorly cooked meat containing encysted *Trichinella spiralis* larvae. Due to the presence of digestive fluids in the stomach, larvae are released. They enter the mucous membrane of duodenum and jejunum where they grow to attain sexual maturity. The males die after fertilizing the females, and the females start producing larvae 6-7 days after infestation. Juveniles enter the lymph and small intestine capillaries. They are distributed by blood throughout the body. They reach many organs, but are able to survive only in striated muscles. The juveniles grow within muscles and the muscle tissue starts forming cysts. Encysted larvae can remain viable for decades. *Trichinella spiralis* causes specific humoral and cellular responses. Antibodies IgG, IgM and IgA together with eosinophil are a dead end for the larvae [6,7,8].

Cases of trichinosis in humans have been reported from most parts of the world. However, reviews of literature have revealed only a few cases of human trichinosis in India. The first case in India was reported in a 31 yrs old female with proximal muscle weakness from Garwal hills, who presented with diagnosis of inflammatory muscle disease [9]. There is not much data about *Trichinella spiralis* infestation related to parotid gland swelling. However, there are many case reports on *Trichinella spiralis* presenting in the muscle tissue as discovered in various clinical presentations like gluteal abscess [10], polymyositis [11]. Many cases are seen as incidental findings in surgeries of breast carcinomas [12], laryngeal carcinoma [13] and carcinoma of tongue [14]. Also there is a report about an experiment in which *Trichinella spiralis* infection in muscles of white rats may have a carcinogenic effect on their muscles [15]. A laboratory finding that is always associated with *Trichinella spiralis* infection is eosinophilia in the blood examination [16].

