An Oral Sparganosis Producing Eggs in Cytological Observation

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Sparganosis is a rare parasitic disease caused by the infection of plerocercoid tapeworm larvae of the genus Spirometra. Up to date many cases of oral sparganosis had been diagnosed from biopsy specimens in Korea, however, in this study a 14 years old male showed an oral sparganosis in his buccal nodule producing its eggs, which were extruded through the ulcerated surface of buccal nodule. In the cytological observation for the pus-like exudates many ovoid parasite eggs were found with a lot of inflammatory cells, which were mostly composed of eosinophilic polymorphonuclear leukocytes (PMNs). The eggs were measured about 50x50x80 μm, and had an operculum without opercular shoulder. In the subsequent biopsy examination the buccal nodule disclosed a diffuse granulomatous lesion with tunnel-like spaces containing eosinophilic materials of parasite tegument, also infiltrated with a lot of eosinophilic PMNs. Therefore, we diagnosed it oral sparganosis producing its eggs with the characteristic features of sparganum granuloma in the cytological and histological observations, and also suggested that the cytological finding of parasitic eggs would be helpful to confirm the parasitic infection of sparganum matured enough to produce its eggs.

Key words: Oral sparganosis, Eggs, Mature worm, Cytological observation.

I. Introduction

Sparganosis is caused by plerocercoid larvae of pseudophyllidean tapeworms belonging to the genus Spirometra. Although cases have been reported worldwide, sparganosis infection is usually found in East Asia, and it is more common in Korea1). The life cycle of Spirometra is complex, involving two intermediate hosts. The adult tapeworm is hermaphroditic and resides in the ileum of its definitive host, which are canines and felines like dogs and cats. After self-fertilization occurs, eggs are produced, and the unembryonated eggs leave the animal in the feces. When contact with fresh water occurs, the egg hatches into a ciliated embryo known as a coracidium, which is released into water to infect the first intermediate host, a copepod. The plerocercoid larva develops in the copepod. The infected copepod is ingested by the second intermediate host such as amphibians, reptiles, birds, and mammals. In the vertebrate the worm grows into plerocercoid larvae, often referred as sparganum. If the definitive host ingests the second intermediate host, the tapeworm matures and begins producing eggs, which are ovoid and have an operculum1,2). In humans, it is usually transmitted by either oral ingestion of infected cyclops-containing water or ingestion of the infective
plerocercoid larvae in raw amphibians, reptiles. It is also infected by local application of the flesh of an infected vertebrate to the skin or conjunctiva, resulting in the migration of the sparganum into human tissues. Sparganum can migrate widely into the subcutaneous tissues and the visceral organs from the small intestine and the resulting symptoms are different depending on the organs involved. Sparganosis usually manifests as a migrating subcutaneous nodule in the abdominal wall, extremities, or urogenital organs and breast.

As it is popular in Korea eating raw snakes or frogs and drinking natural spring water in mountain side, many cases of sparganosis has been reported. Here, we reported a rare case of intraoral sparganosis in a 14-year-old male with the features of both cytological and histological observations.

**II. Case report**

A 14 years old male showed an exophytic nodular mass measured about 5x5x7 mm in his buccal mucosa, which was non-painful, but recently it was irritable during mastication. The nodular lesion discharged puslike exudates through an ulcerated orifice by slight percussion. The exudate was smeared for cytological observation, and many parasitic eggs measured about 50x50x80 μm were found with severe infiltration of eosinophilic PMNs. The egg was ovoid in shape and had an operculum without shoulder in its top side.

Thereafter, the nodular lesion in his buccal cheek mucosa...
was excised and examined by pathological method. The nodular lesion consisted of a diffuse granulomatous tissue in the submucosal area, and in the center of the granuloma there appeared tunnel-like spaces filled with eosinophilic materials of parasitic tegument. The granuloma was mainly composed of histiocytic macrophages, small round cells, and a lot of eosinophilic PMNs. These findings indicated a parasitic granuloma, and the parasitic teguments in the tunnel-like spaces were identical to those of sparganum.

The usage of the pathological specimens filed in the Department of Oral Pathology was approved by Life Ethic Committee (GWNUDH(IRB)2009-16-3).

### III. Discussion

Sparganum is a whitish or yellow ribbon-shaped muscular worm of variable size from 5 to 20 cm in length. This worm can easily penetrate the tissue and migrate through the intestinal wall by producing several kinds of proteinase\(^1\). Sparganosis most frequently appears as slowly growing and migrating subcutaneous nodules in the abdominal wall, extremities, or urogenital organs. The human sparganosis has been also reported from different areas of body including eye, breast, brain and oral cavity\(^6\)\(^9\)\(^12\).\(^9\)

Previously, we reported rare cases of sparganum infection in jaws, resulted in chronic suppurative osteomyelitis and chronic maxillary sinusitis\(^13\)\(^14\). And in the present study a patient, 14 years old male showed an exophytic nodular mass measured about 5x5x7 mm in his buccal mucosa, which was asymptomatic but irritable only during mastication. The cytological observation using the smeared specimen from buccal cheek mucosa showed many parasitic eggs with heavy infiltration of eosinophilic PMNs. The egg was ovoid in shape and had an operculum without shoulder in its top side.

Although the incidence of sparganosis is sporadic in Korea, Gangweon\-do is known to be highly endemic area of sparganosis more than other provinces in Korea. In the seroepidmiologic examination (ELISA) for the detection of anti-spirometra erinacei plerocercoid IgG the normal inhabitants in Hongcheon\-gun, Gangweon\-do showed the positive rate of 3.3% in 719 adults. Data of the questionnaire for 24 ELISA-positive inhabitants revealed that 20 had a history of eating raw meat of snakes, 24 had a history of eating frogs, and 24 had a history of drinking stream water. Two positive cases had a past history of sparganosis. Two positive cases showed current symptoms of sparganosis\(^9\).

It was also reported in China that for the natural environment of sparganum infection the infection rate of plerocercoids in cyclops was 3.5% (3/85) and that of spagarna in tadpoles and frogs was 35.9% (120/334) and 16.8% (75/446), respectively. Among 3 cats and 31 dogs investigated for the artificial sparganum infection experiment, 1 and 6 (19.4%) were found infected, respectively. Eggs of Spirometra mansoni were found in feces of cats 12 days after the infection, 17 adult worms were found in the intestine of the cat on the 25th day after the infection. The investigation reveals a high prevalence of spirometra mansoni in the intermediate and final hosts. However, the local residents in China were known to eat live tadpoles habitually, thereby, eating live tadpoles seems a main reason of getting sparganosis mansoni\(^13\).

In the diagnosis of sparganosis the history taking for the habitual eating of raw meat of frog, snake, and pork was necessary. But the present patient, 14 years old boy, said he had never eaten any raw ones in his whole memory. Therefore, we asked more to know about his living environments, such as hygiene status of home, family medical history, and the major water source to drink. Finally, we found that he enjoyed so much to drink the natural...
spring water in the mountain side after hiking and playing with friends.

In the present study we didn’t examine the natural spring water he had drunken to know whether any copepod in the natural spring water was infected with procercoid larva of Spirometra or not, but it was already reported that the natural spring water obtained from the mountain side of Gangwon province was much contaminated with different species of copepod as well as organic waste products. Therefore, we presumed that the present patient ingested the copepod infected with procercoid larva of Spirometra, and finally oral sparganosis appeared in his buccal mucosa.

Although praziquantel and niclosamide are recommended for the treatment of sparganosis, the surgical removal should be necessary and the prevention of infection requires avoidance of ingestion of raw or undercooked meat, as well as the proper disposal of human wastes. However, the present patient showed no other granulomatous lesion, thereby he was referred to general hospital to receive medicinal treatment for sparganum infection.

In conclusion, the present case was diagnosed as oral sparganosis producing its eggs by the cytological and histological observation. As the sparganum eggs were extruded through the ulcerated surface of buccal nodule, it was suggested that the cytological finding of parasitic eggs would be helpful to confirm the parasitic infection of sparganum matured enough to produce its eggs.

IV. References


