Aural gnathostomiasis*

Pakpoom Supiyaphun**
Prasert Sitthichareonchai***
Amnuay Cutchavaree**


Human gnathostomiasis that involves the ear, mastoid cavity and facial nerve is a rare entity. We present a case of Gnathostoma spinigerum that caused intermittent left sided otalgia accompanied by deafness in a 48-year-old Thai female. The worm finally exited through the tympanic membrane. We also review the literature and remind the laryngologist in Asia to be aware of the possibility of infection in a patient complaining of otalgia.

Reprint request: Supiyaphun P, Department of Otolaryngology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.
Received for publication. March 13, 1990

* This paper was presented in the Thai - Japan E.N.T. Clinical Conference, Grand Ballroom, Narai Hotel, Bangkok, Thailand. Jan 9, 1987.
** Department of Otolaryngology, Faculty of Medicine, Chulalongkorn University.
*** Department of Parasitology, Faculty of Medicine, Chulalongkorn University.
การศึกษาของผู้ป่วยด้วยข้อหู กระดูกสมองหลอด และ facial nerve ทั้งที่ไม่มีอาการ ผู้ป่วยหญิงไทยอายุ 48 ปี ซึ่งมีอาการปวดหูข้างขวาเป็นครั้งคราว และหูข้างข้างหน้าพบว่ามีภูมิคุ้มกันทางตาทั้งข้างเวย์ และพบด้วย facultative ผู้เห็นทุกๆอาการผ่านไปแล้วไม่ปรากฏอาการปวดหู คือ อนุมัติให้ตัดสินตามหลักการในผู้ป่วยที่มีอาการปวดหูไว้ที่วาย
Human gnathostomiasis is mainly caused by Gnathostoma spinigerum (G. siamense - Livinsen 1980). Few cases were reported to be caused by G. hispidum. Gnathostoma infection and parasites are fairly common in Thailand, Japan, China, the Phillipines and other areas where raw and pickled fish are a part of the diet.\(^{(1,2)}\)

Aural gnathostomiasis is a very rare entity. Datta in 1930 described cutaneous gnathostomiasis involving the temporal muscle which resembled acute mastoiditis.\(^{(3)}\) Prasansuk and Hinchcliffe in 1975 reported a case of intracranial gnathostomiasis that migrated via facial canal into the middle ear and finally exited through the tympanic membrane.\(^{(4)}\) In 1977, Boongird et al. also recorded the intracranial gnathostomiasis that produced facial nerve paralysis and swelling over the mastoid region.\(^{(5)}\) In 1985 the senior author of our group (A.C.) described a case of aural gnathostomiasis presenting with sudden otalgia in a Thai female patient.\(^{(6)}\) In that case, two gnathostoma larvae were found located between the epithelial and the fibrous layers of the tympanic membrane. Recently, an additional case was encountered and will be presented herein.

### Report of a case

A 48-year-old Thai woman living in the rural area presented to the E.N.T. clinic with a complaint of a intermittent left-sided otalgia accompanied by deafness, serous otorrhea and tinnitus for one month duration. Vertigo was noted once in the last month and some dysequilibrium persisted till the time of examination. Past history revealed that the patient ate uncooked fish once in the past year. She also had the intermittent migratory swelling over the left temporal and periauricular regions during the same period.

Physical examination revealed that the worm was stuck on the lower half of the tympanic membrane with its head penetrated through the perforation. There were some swelling, edema and granulation tissue reaction around that area. (Fig. 1) The worm was removed by alligator forceps and it was identified as an immature female of Gnathostoma spinigerum and measured 13.50 × 1.54 mm. (Fig. 2,3) After removal of the parasite, pulsatile serous discharge through the perforation was observed.

![Figure 1](image1.jpg)

**Figure 1.** Appearance of the tympanic membrane after removal of the parasite. There is a perforation (arrow head) at the tip of a localized swollen tympanic membrane.

![Figure 2](image2.jpg)

**Figure 2.** The parasite, immature female of G. spinegerum measured about 1.54 × 13.50 mm.
Laboratory investigations included the hemoglobin level of 11.0 gm/dl, white blood count 9300/mm³ with 56% neutrophils, 19% eosinophils and 25% lymphocytes. Skin test for Gnathostoma spinigerum was positive. The audiogram showed a total deafness of the left ear and normal hearing on the other. The patient was followed up one week later and the tympanic membrane was completely healed but unfortunately the hearing did not return.

**Figure 4.** The life cycle of Gnathostoma spinigerum (after Daengswang).

**Discussion**

The life cycle of G. spinigerum involed the definitive host and two intermediate hosts\(^{(7)}\). (Fig. 4) Adult worms live coiled in the wall of the stomach of the definitive hosts (tiger, cat and dog) and eggs are extruded from these lesions. The first intermediate host is the copepods in which the second stage larvae are formed. The second intermediate hosts are a number
of fresh-water fish, frogs, snakes and birds. The third-
stage larvae are encysted in the flesh of these animals.
Man is considered an accidental host and Gnathostoma
infection is noted whenever he consumes inadequately
heated flesh containing the encapsulated third-stage larvae.
The larvae male or immature female. These adults and
advanced third-stage larvae migrate throughout the body
causing the characteristic migratory swelling or more
deep visceral lesions in the abdomen, eyes and brain.

Gnathostomiasis is usually not considered as
the cause of otalgia. Whenever the previous history of
being in the endemic area, eating of the uncooked food
with subsequent migratory swelling are noted, provisional
diagnosis is made. Confirmation relies on the pertinent
laboratory findings, those are eosinophilia, positive skin
test for Gnathostoma and identification of the worm.(1-2)
Based upon the above findings our cases were diagnosed
as aural gnathostomiasis. The previous studied case
revealed two worms located in their tracts between
epithelium and fibrous layer of the tympanic membrane
and did not enter the middle ear.(6) The worm in the
present case was found protruding through the ear drum.
Migration of the worm in this case may either pass through
the fissure of Santorini or enter the eustachian tube into
the middle ear and caused inner ear damage by way of
toxic reaction or direct injury through the round
window. Finally it exited through the tympanic membrane
and created a perforation and granulation tissue which
in turn developed otalgia and otorrhea.

Summary
We present an additional case of aural gnathosto-
miasis that caused otalgia. Immature female of Gnathos-
toma spinigerum was found sticking in the lower half of
the tympanic membrane with its head protruding through
the swollen, edematous tympanic membrane.
This case as well as our previous case study are
presented to remind the Asian Otolaryngologists
who live in the home of Gnathostomas to be aware of
this possible entity when dealing with otalgia.

References
1. Faust ER, Russell PF, Jung RC. Plasmid hematode
parasites of Man-Spiruroidea. In: Craig CF, ed.
Craig and Faust’s. Clinical Parasitology. 8th ed.
2. Markell EK, Voge M. The blood and tissue Dwelling
nematodes. In: Markell K, Voge M, eds. Medical
Parasitology. 3rd ed. Philadelphia: W.B.
Saunders, 1971. 272-4
3. Datta S. Infection by a Gnathostoma simulating
4. Prasansuk S, Hinchcliffe R. Gnathostomiasis : a case
of otalgia interest. Arch Otolaryngol 1975 Apr;
101(4) : 254-8
5. Boongird P, Phuapradit P, Sindej N, Chirachariyavej
T, Chuahirum S, Vejjajiva A. Neurological
manifestations of gnathostomiasis. J Neurol
Sci 1977 Mar; 31(2) : 279-91
6. Cutchavaree A, Supiyaphun P, Sithichareonchai P,
Suphanakorn S. A case of Aural Gnathostomiasis.
7. Daengsvang S. A monograph on the Genus Gnathostoma
and Gnathostomiasis in Thailand. SEAMIC
Southeast Asian Medical Information Center,
Tokyo, 1980.