HUMAN TUNGIASIS (*TUNGA PENETRANS*): A REPORT ON THREE JAPANESE INFECTED IN VENEZUELA

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Abstract: Tungiasis of authors' own, suffered during the stay in Parima mountains in the Federal Territory of Amazonas, Venezuela from 19th October to 2nd November, 1982, was reported. Of the authors, three were infected with *Tunga penetrans*, developing one, four and five lesions on feet, respectively. In all the cases, gravid fleas were removed by curettage and the antibiotic ointment was applied on the wounds. Pain disappeared soon and lesions healed smoothly after treatment.

The chigoe flea, *Tunga penetrans* Linnaeus, 1758, is widely distributed in tropical and sub-tropical regions of North and South Americas, the West Indies and Africa. It is called as *nigua* and *bicho do pé* in Latin America. The flea parasitizes on various vertebrate animals on the land. Although it is originally a tiny flea, after penetration into the skin, the gravid female eventually enlarges like a small pea. The burrowing into dermal tissue of man frequently causes serious inflammation of the affected feet and other portions, which can lead to ulceration and fibrosis. Further, tungiasis ulcer can easily be followed by secondary bacterial infections.

The authors stayed in Parima region of Amazonas state in Venezuela for the studies on onchocerciasis during the period between October and November, 1982. They walked around the field to collect larvae and adults of blackflies and the housing areas called "Shabono" of Yanomama Indian. During and after this survey, they found chigoe fleas in themselves. The report deals with this experience.

CASE REPORT

Case 1. S. N., 34 year old male. The patient was parasitized by five chigoe fleas. One of these burrowed into the skin of lateral portion of the first toe of the left foot. The remaining four were found all from the first toe of the right foot; one, aside the nail, two under the nail, and one in the sole. As he noticed the infection of fleas

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before leaving Parima, all fleas were still small and seemed like a white patch with a black dot in the center. They were removed easily by incision of the affected skin with an injection needle. Suppuration and bleeding were not observed thereafter.

Case 2. H. S., 43 year old male. The patient was parasitized by one flea alone. It burrowed into the skin under the nail of the fourth toe of the left foot. The size of flea was approximately 5 mm in diameter, when he became aware of the infection seven days after the departure from Parima. The lesion showed translucent nodule with a central dark spot inside the skin and was suppurative. Bleeding was seen while the flea was enucleated.

Case 3. I. T., 47 year old male. Four chigoe fleas were found: two, aside and under the nail of the fourth toe of left foot (Photo. 1); one, between the first and second toes of the right foot; and one, under the nail of the third toe of the right foot. Within seven days after leaving there, the patient noticed the infection of the former three fleas which looked like translucent subcutaneous nodule with a central dark spot on the surface. On the other hand, the fourth flea was found out 25 days after he left the Parima region when the peculiar sensation of affected region increased. As this lesion had been covered by a preceding subcutaneous bleeding, it was overlooked when other lesions were discovered before (Photo. 2).

In all the cases after enucleation of insects, broad-spectrum antibiotic ointment was applied. Peculiar sensation, itching and pain disappeared. The lesion healed rather quickly.

DESCRIPTION OF CHIGOE FLEA

Flea specimens removed were microscopically examined for entomological identification. All the females were found to be gravid, harbored many ova (ca. 0.63 mm long by 0.32 mm wide), and were identified as *Tunga penetrans* by possessing no ctenidium on the pronotum, no suture from the base of the antennal groove to the vertex, sharply-angled frons, elongated mandibles with distinct serrations, and the anterior apical angle of the hind coxae projecting downwards as a triangular tooth (Photo. 4), as defined in the key of Smit (1973).

DISCUSSION

Various tungiasis cases have been previously reported. Nishimoto and Nakajima (1975), Goldman (1976), Monti *et al.* (1980), Ott *et al.* (1980) and Zalar and Walther (1980) reported imported cases from Africa, and Scholten *et al.* (1977), Brothers (1979) and Soei and Van der Kaay (1980) reported similar cases who returned from South America. In these reported cases, the pulp and sides of the toes were the most affected regions rather than the sole or dorsum of the toes shown in author's cases.

The present report, the second case-report among Japanese, shows that in the infestation foci of chigoe flea, visitors would easily be parasitized even in a short term of stay.

Current treatment of human tungiasis is limited to the immersion of the affected limb into four per cent formalin solution or exposure to DDT spraying (WHO, 1979).

The flea can also be removed by incision. Ade-Serrano *et al.* (1982) tested niridazole against tungiasis, in which burrows were effectively dried up within 3 weeks. However, most reliable and simple way of treatment is to dig the flea out by a cleaned needle bloodlessly. This treatment procedure has been empirically adopted by native people using a wooden stick or needle.

The tourists who travel endemic areas of tungiasis should not walk barefooted and/or with sandals alone. Application of repellent is recommendable. Because it is said that even shoes are not effective barriers for chigoe fleas. If one noticed the infection with an early stage of flea, it should be dug out soon with a cleaned needle. Because, tetanus and gas gangrene cases have ever been reported hitherto as the complication of tungiasis in Central America.

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ベネズエラで経験したスナノミ症

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著者らはオンコセルカ症の調査のため、1982年に約2カ月間ベネズエラ国アマゾナス州と北部諸州とに滞在した。そのうち10月19日から11月2日までアマゾナス州パリマとその周辺に滞在し、オンコセルカ症を媒介するブユの採集と疫学調査を実施した。特に、シャボノと呼ばれるヤノママ族の家屋内を歩いた。その後、4人のうち3人がスナノミの寄生をうけた、寄生数はそれぞれ5, 4, 1匹であった。摘出された標本の形態的特徴から、これらはすべてスナノミ *Tunga penetrans* と同定された。皮膚を切開してスナノミを取り除き、抗生物質軟膏を塗布したが、その後、痛みと独特な異物感は消失し、創口は急速に治癒した。

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Photo. 1 Two lesions caused by infection with *Tunga penetrans* on the fourth toe of the left foot in the third case.

Photo. 2 Lesion caused by infection with *T. penetrans* on the third toe of the right foot in the third case. It was covered by a subcutaneous bleeding before enucleation.

Photo. 3 The same lesion shown in Photo. 2 after enucleation.

Photo. 4 Lateral view of gravid female of *T. penetrans* removed from the first case (showing only head and thorax). a, frons sharply angled. b, anterior apical-angle of hind coxa projecting downward as a triangular tooth.