

Two Cases of Tick Bite Showing Localized Fat Herniation Response

Eugene Jeong, M.D., Hyun Jeong Park, M.D., Jun Young Lee, M.D., Baik Kee Cho, M.D.

*Department of Dermatology, St. Mary's Hospital, College of Medicine,
The Catholic University of Korea, Seoul, Korea*

The pathology related to a tick bite reaction is well described. Formation of a cavity below the mouthparts of the tick and mixed dense cellular dermal infiltration are general histopathologic findings of a tick bite. In addition, granuloma formation, vasculitic response, and panniculitis were reported. We present two cases of tick bite showing a new histopathologic finding, a localized fat herniation response. (*Ann Dermatol (Seoul)* 18(2) 70~72, 2006)

Key Words: Tick bite, Fat herniation

INTRODUCTION

Ticks are well-known blood sucking ectoparasites whose hosts are reptiles, birds and mammals, including humans¹. Ticks are of medical importance. They cause dermatologic disease, directly by biting, and indirectly via acting as a vector of bacterial, viral, protozoal and rickettsial disease². Dermatologic and systemic changes are observed following physical and chemical stimuli at the feeding site, or from the pathogen transmitted during feeding. Since there is difficulty in diagnosing a tick bite when this organism is no longer present at the site, various systemic and localized tick bite reactions have been described to aid diagnosis. We herein suggest a new histopathologic finding which has not been reported as of yet.

CASE REPORT

Two women presented with a tick bite in our dermatologic clinic. One patient was a 61-year-old

female with an 8 mm-sized gray-colored tick, which had been firmly attached to the left upper abdomen for 6 days (Fig. 1A). The other patient was a 23-year-old female with a 4 mm-sized tick which had been attached to the back for 3 days (Fig. 1B). The ticks were surrounded by a mildly pruritic erythematous halo. The patients were otherwise well. Both patients had a history of recent mountain climbing. Since the ticks could not be removed by heat or gentle traction, details such as the mouthpart of the ticks were not observable. For diagnostic and therapeutic purposes, an excisional biopsy was held for each patient. The tick was included in the biopsy site.

At low magnification, the sagittal section of the arthropod, with degenerated epidermis and papillary dermis around the mouthpart was observed (Fig. 2A). A higher magnified view revealed pieces of hypostome in the upper dermal cavity and dense inflammatory infiltrates, mainly composed of neutrophils and extravasated red blood cells in the intradermal cavity. The subcutaneous fat tissue and dermal collagen fibers were pulled towards the hypostomal cavity in the upper dermis (Fig. 2A, B). We named the above finding as "fat herniation" and described the conception of finding schematically at Fig. 3. We also observed some septal or lobular panniculitis (Fig. 2A).

No additional treatment was given after the excisional biopsy. On follow-up examination after 8 months, no residual cutaneous findings or constitutional symptoms were noted.

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Reprint request to: Hyun Jeong Park, M.D., Department of Dermatology, College of Medicine, The Catholic University of Korea, St. Mary's Hospital, 62 Youido-dong, Youngdeungpo-gu, Seoul 150-713, Korea. Tel. 82-2-3779-1233, Fax: 82-2-783-7604, E-mail. hypark@catholic.ac.kr

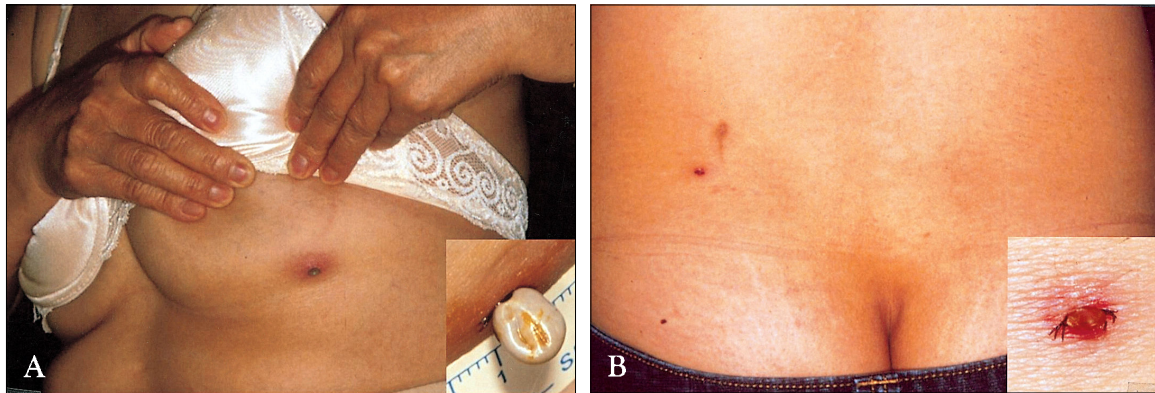


Fig. 1. (A) A 61-year-old female with an 8 mm-sized, gray-colored tick on the left upper abdomen. (B) A 23-year-old female with a 4 mm-sized tick on the lower back.

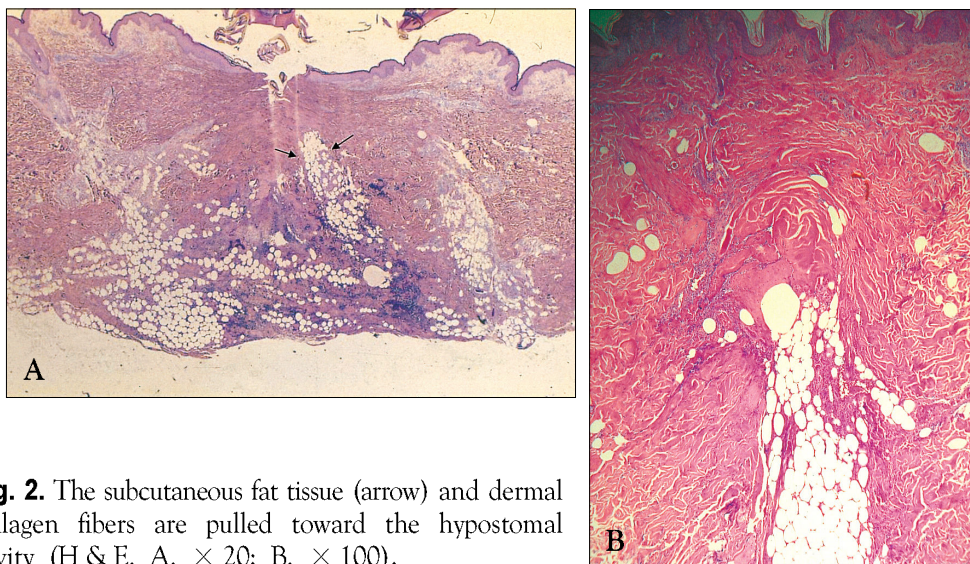


Fig. 2. The subcutaneous fat tissue (arrow) and dermal collagen fibers are pulled toward the hypostomal cavity (H & E, A, $\times 20$; B, $\times 100$).

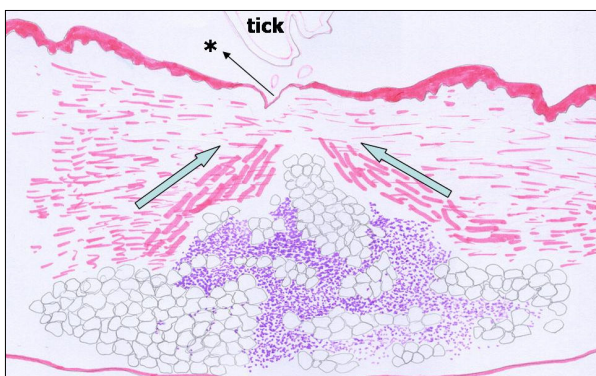


Fig. 3. A diagram of fat herniation. The focal destroyed epidermis (*) and pulled collagen fibers and fat tissue admixed with inflammatory infiltrates.

DISCUSSION

To our knowledge, this is the first case report of tick bite showing localized fat herniation. Characteristic histopathologic findings of localized tick bites have been described before. Besides the mild to intense inflammatory dermal infiltrates, two kinds of intradermal cavities are generally formed^{1,3,4}. The cavity in the upper dermis, which contains pieces of hypostome, can be formed by physical trauma as the tick inserts its mouthpart¹. Saliva of the ticks, secreted during blood-sucking, makes another cavity by a chemical reaction². Other findings of tick bite are foreign body granuloma, pseudolymphoma, or cryoglobulinemic vasculitic response^{5,6}. The histo-

pathologic changes of fat tissue have been reported as lobular or septal panniculitis⁴.

The characteristic histopathologic findings of a tick bite were found in our case, including the hypostomal cavity and feeding pool. Fat tissue and dermal collagen fibers pulled towards the upper dermal cavity was observed too. To our knowledge, fat herniation by tick bite has not been mentioned in literature before. This finding is assumed to be caused by the blood-sucking motion of the tick. Ticks, especially the hard ones, can suck a blood meal for a much longer period compared to other ectoparasites. Our patients were sucked for a relatively long time (for 8 and 3 days respectively). The phenomenon of the fat tissue pulled towards the mouthpart strongly supports the theory that fat herniation may be related to the sucking motion. We failed to find another case that revealed a similar histologic view to ours in other specimens of a tick bite, as well as in Korean and English dermatologic journals, because the depth of the biopsy of most specimens was not deep enough to include the fat layer. If a deep biopsy, which covers the fat tissue is performed, we could find additional cases showing a fat herniation response.

It is difficult to diagnose a tick bite unless the tick is in situ, the mouthparts are in situ, or the patient mentions having been bitten by a tick. We suggest that this fat herniation pattern should be

one of the characteristic findings of a tick bite. We believe this particular finding will aid the diagnosis of a tick bite.

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