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Nodular Fasciitis of the Face Diagnosed by US-Guided Core Needle Biopsy: A Case Report[1]

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We report here on a case of nodular fasciitis (NF) that was diagnosed by ultrasonography (US)-guided core needle biopsy in a 31-year-old man, and we include the US and computed tomographic (CT) findings and the histopathologic findings at US-guided core needle biopsy (CNB). We suggest that high-resolution US is useful for the detailed evaluation of NF in the superficial regions, such as the face, and US-guided CNB is useful for the definitive histologic diagnosis of NF without causing scarring.

Index words : Soft tissues
Neoplasms
Ultrasound (US)
Fasciitis

Nodular fasciitis (NF) is a benign, reactive, tumor-like proliferation of myofibroblasts that appears as a rapidly growing solitary mass. The most common locations are the extremities; this is followed by trunk, head and neck in decreasing order. A literature search yielded only a few reports concerning the imaging findings of NF (1 - 5). Most of those reports are focused on the computed tomographic (CT) and magnetic resonance (MR) imaging findings of NF in the extremities and the neck. Ultrasonography (US) is the usual initial diagnostic modality for evaluating a palpable mass in the face. Thus, knowledge of the gray-scale and color Doppler US findings of NF is prerequisite for radiologists. A few reports (6 - 8) have stressed the role of the fine needle aspiration cytology (FNAC) in the cytologic diagnosis of NF in the extremities, breast and face, but the role of US-guided core needle biopsy (CNB) in the histologic diagnosis of NF has not been discussed.

We report here on a case of NF of the face along with gray-scale and color Doppler US and CT findings, and we report on the role of US-guided CNB for the histologic diagnosis of NF of the face.

Case Report

A 31-year-old man presented with a palpable mass at the right cheek that was noticed 1 month earlier. There was no history of previous trauma. On physical examination, a firm, nontender, mobile mass about 3 cm in size was found at the right cheek. US demonstrated an approximately 2.5 cm sized lobular markedly hypoechoic solid mass in the right cheek that probably arose from the perioral muscle and it was protruding into the subcutaneous fat (Figs. 1A, B). Prominent vascularity was noted within the mass on the color Doppler images (Fig. 1C). Non-enhanced computed tomography (NECT) revealed a well circumscribed mass that was isoattenuated compared to the adjacent muscles, and it was mainly in the subcutaneous layer. The axial contrast-enhanced CT (CECT), and coronal and sagittal reformatted CECT images demonstrated a well-demarcated solid

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mass with slightly inhomogeneous, strong enhancement. The mass was inseparable from the perioral muscles (Fig. 2). The patients underwent US-guided CNB using an automated gun with an 18-gauge needle (Fig. 3A) without any skin incision. Histologically, the tissue cores consisted of short spindle cells and an intervening hyalinized matrix (Fig. 3B). The tumor cells were mostly fibroblasts arranged in short, irregular bundles and fascicles with intermixed lymphoid cells. We also noted mitotic figures and scattered foci of microhemorrhage between the bundles of fibroblasts (Fig. 3C). Immunohistochemically, the tumor cells showed strong positivity for vimentin (Fig. 4A) and αsmooth muscle actin (Fig. 4B). The patient underwent surgical excision of the mass through an intra-oral incision under general anesthesia. The gross specimen showed a well-demarcated, pale tan colored mass with rubbery consistency. The microscopic findings of the excisional biopsy were the same as those of US-guided CNB. The postoperative course was uneventful and there has been no evidence of neurologic deficits or recurrence for six months after the operation.

Discussion

In our hospital, US is the usual initial diagnostic modality for evaluating a palpable mass of the face. The recently available high-resolution scanner can well depict the relationship between the mass and the surrounding structures, and particularly in case of superficial lesions. There are no reports concerning the US findings of NF of the face in the English literature. However, there have been several reports concerning US findings of NF of the neck in the English literature (3, 5). According to them, the lesion was isoechoic in one patient, hypoechoic in one patient, and mixed iso- and hypoechoic in one patient. For one patient who underwent color Doppler US, low level vascularity was noted within a hypoechoic mass. The lesion in our case was markedly hypoechoic on the gray-scale images, and

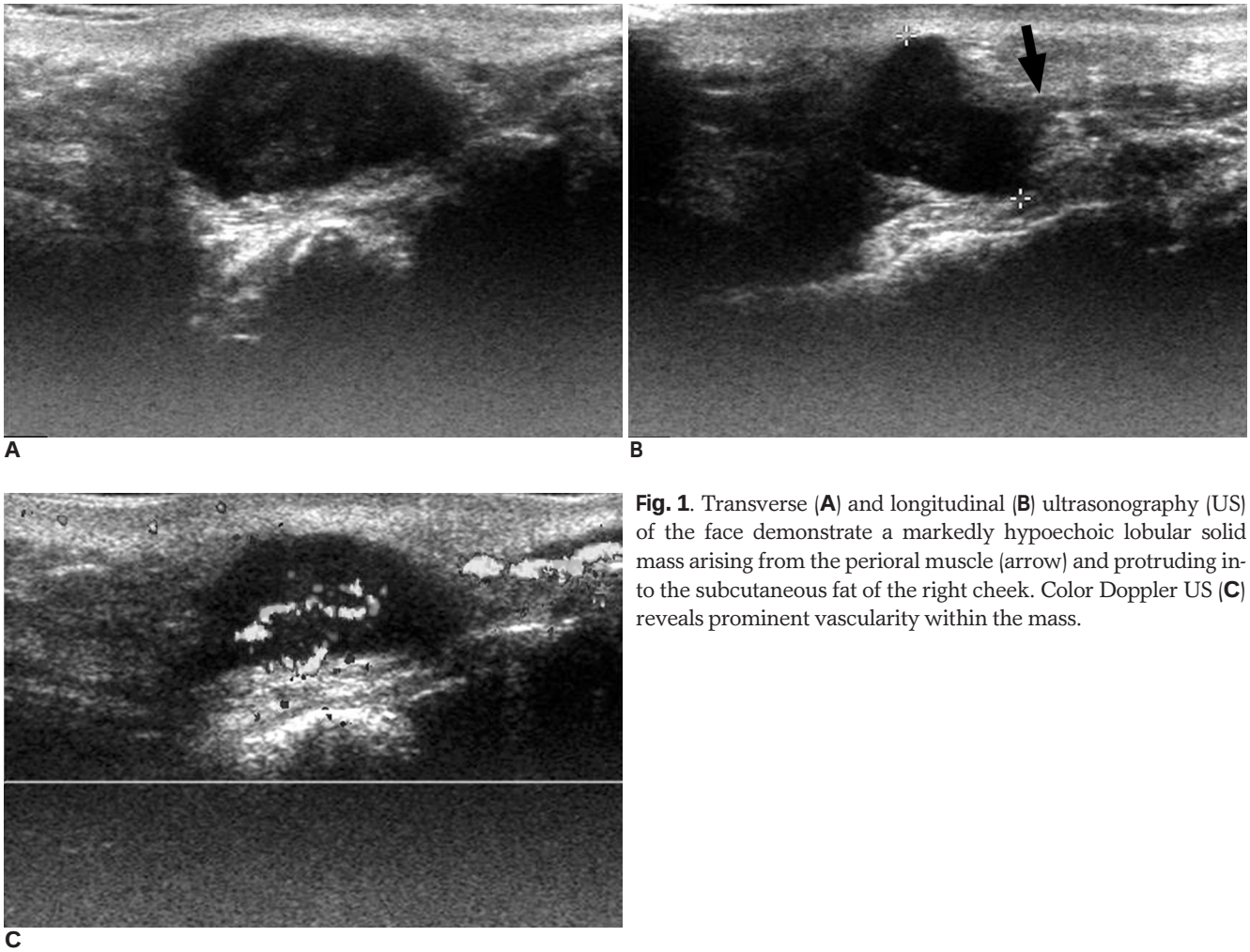

Fig. 1. Transverse (**A**) and longitudinal (**B**) ultrasonography (US) of the face demonstrate a markedly hypoechoic lobular solid mass arising from the perioral muscle (arrow) and protruding into the subcutaneous fat of the right cheek. Color Doppler US (**C**) reveals prominent vascularity within the mass.

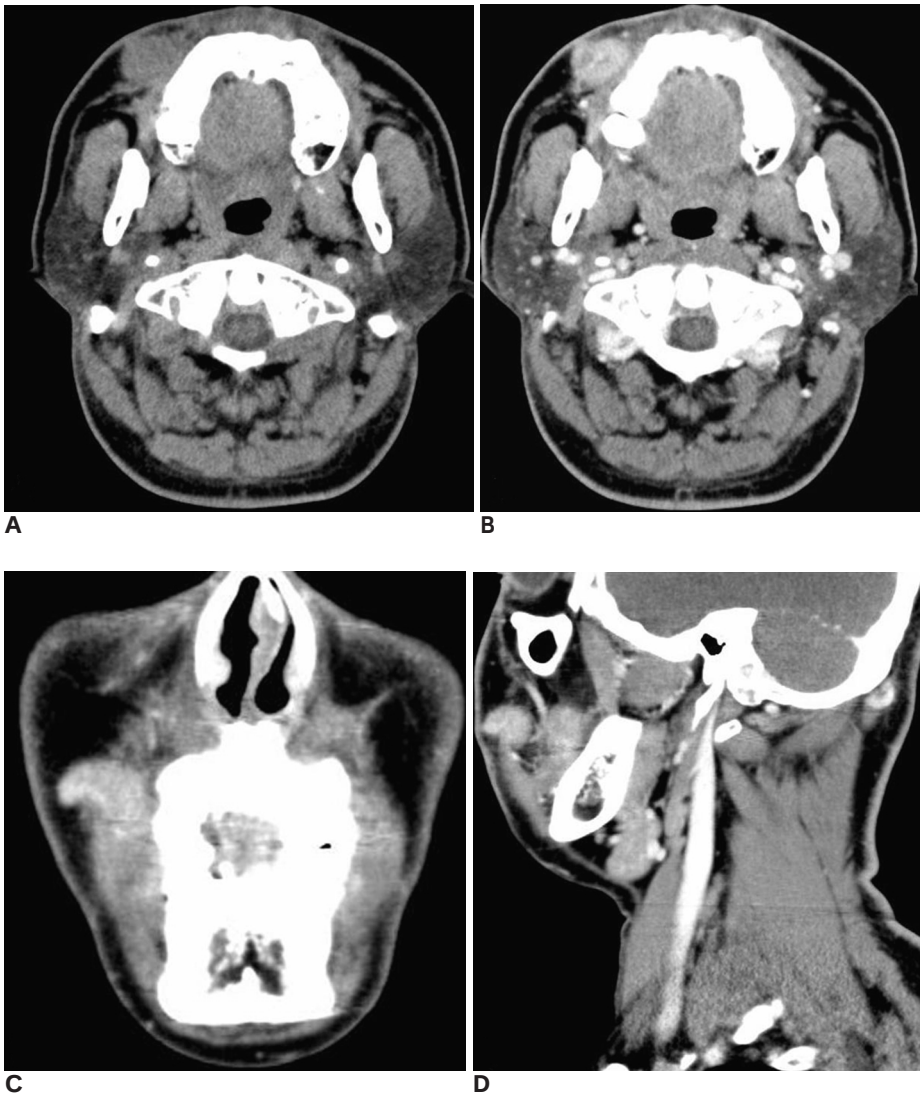

Fig. 2. Non-enhanced CT of the face (**A**) demonstrates a soft tissue mass that is isoattenuated to the adjacent muscles, and it is mainly in the subcutaneous layer of the right cheek. The axial contrast-enhanced CT (**B**), coronal (**C**) and sagittal (**D**) reformatted images reveal a lobular mass in the right cheek with slightly inhomogeneous, but strong enhancement.

marked, prominent vascularity was noted within the mass on the color Doppler images. The differences in the echogenicity and color signals on US may reflect the subtypes of NF (i.e., the myxoid, cellular and fibrous types) and the variable vascularity contained in the individual lesions (9). The NECT and CECT findings of NF in our case were similar to those of previous reports in that there was a well demarcated lobular isoattenuating mass on NECT with strong, but slightly inhomogeneous enhancement on CECT.

The pathogenesis of NF remains unknown, but this is most probably a reactive condition that's triggered by local injury or infection rather than it being a true neoplasm. A history of previous trauma has been documented in only a small percentage of cases (4). The rapid growth and extension into surrounding tissues are similar to that is seen for malignant tumors. Thus, making the accurate preoperative diagnosis is important. NF is usually diagnosed by excisional biopsy (10); however, the problems encountered with surgical excision are anesthesia and scarring. Furthermore, NF may undergo spontaneous resolution (6, 10). Thus, performing a non-invasive diagnosis is mandatory. FNAC has been proved to be useful for making the cytologic diagnosis of NF (6 - 8). The cytologic features of NF include a highly cellular smear that is predominantly composed of spindle cells that have a wide variety of sizes, and there is a background of myxoid substance (6). However, FNAC requires the skills of an experienced cytopathologist. We performed US-guided automated CNB with using an 18-gauge needle without skin incision and we obtained a sufficient amount of the specimen for the histologic exam. Microscopically, the lesion was composed of spindle cells arranged in irregular bundles or fascicles, and this was usually accompanied by a small amount of collagen. We feel that US-guided core needle biopsy can re-

place FNAC and excisional biopsy for making an accurate diagnosis and to avoid surgical scarring.

In conclusion, high-resolution US is useful for the detailed evaluation of the NF in the superficial regions, such as face, and US-guided CNB is useful for making the definitive histologic diagnosis of NF without causing scar.

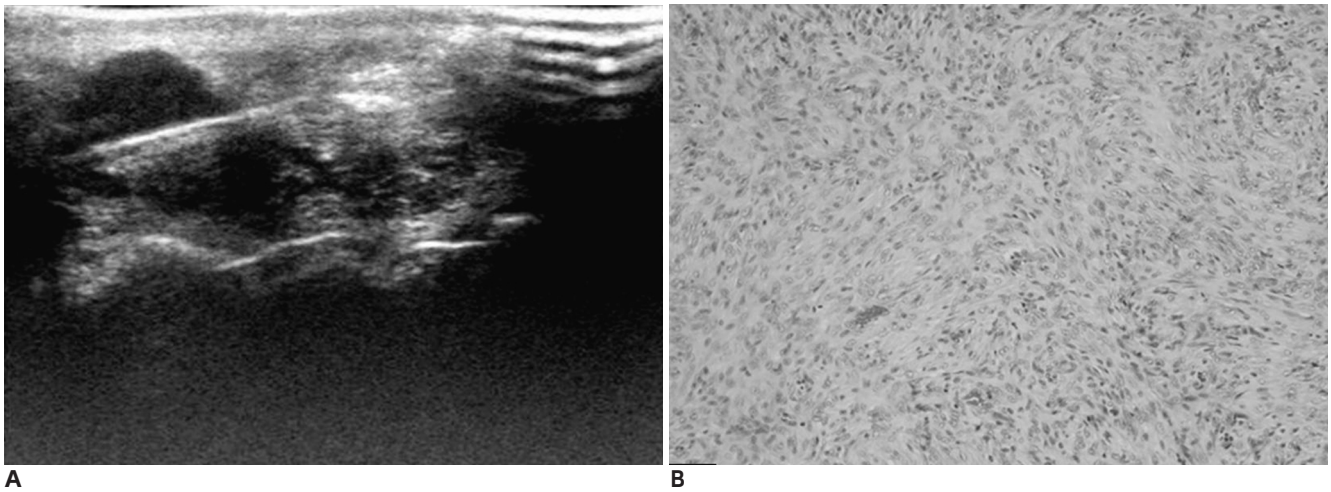

Fig. 3. A linear echogenic needle traversing the mass (**A**) is noted during US-guided core needle biopsy. Microscopically, the tumor shows varying cellularity with areas of hypercellular spindle cell admixed with less cellular hyalinized areas (**B**) (H & E, × 200). Mitotic figures (arrow) and foci of microhemorrhage (arrowhead) are noted between the bundles of fibroblasts (**C**) (H & E, ×400).

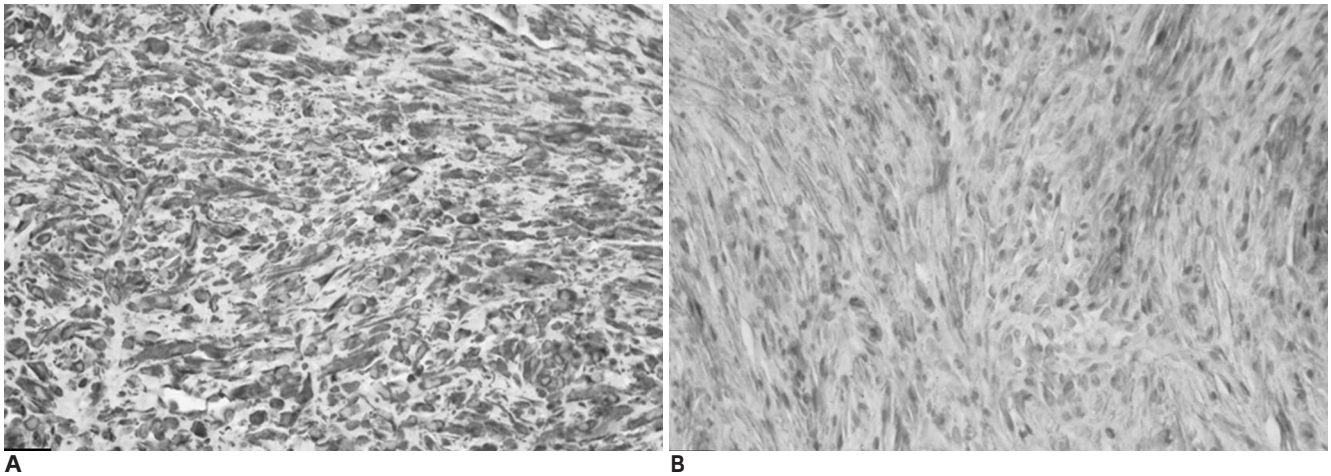

Fig. 4. Immunohistochemical staining show diffuse, strong positivity for vimentin (**A**) (×400), and αsmooth muscle actin (**B**) (× 400).

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초음파유도하 핵 생검으로 진단된 안면부의 결절성 근막염: 1예 보고[1]

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저자들은 핵 생검으로 진단된 31세 남자의 안면부에서 생긴 결절성 근막염을 초음파검사, 전산화단층촬영 및 초음파유도하 핵 생검에 의한 병리 조직학적 소견과 함께 보고하고자 한다. 고해상능 초음파검사는 표재성의 결절성 근막염의 진단에 유용하며, 초음파유도하 핵 생검은 피부의 반흔을 남기지 않는 조직학적 확진을 위한 유용한 검사 방법으로 생각된다.