

## CLINICAL VIGNETTE

# Nodular Fasciitis: A Surprisingly Common But Under recognized Cause of the Solitary Subcutaneous Nodule

By Brian S. Morris, MD

### *Case Report*

The patient is a 43-year-old male with a history of GERD and allergic rhinitis who presents with a newly discovered painless subcutaneous nodule in the right lower extremity. He reports he first noticed the nodule approximately 1 month ago. He does not believe that it has changed over the past few weeks. He has never had prior nodules and he is certain that the nodule was not present prior to one month ago.

His past medical history is remarkable for GERD and allergic rhinitis. His only current medication is esomeprazole and a daily multivitamin. He is allergic to penicillin and aspirin. His social history is remarkable for being a non-smoker and non-drinker. He exercises regularly and has four active young children. His family history is generally unremarkable.

Physical examination reveals a blood pressure of 120/72 mm hg., pulse of 72 beats/minute, temperature of 36.9 C and BMI of 25. His examination is unremarkable except for a discrete, mobile, somewhat hard, non-tender 2 cm subcutaneous nodule on the medial side of the quadriceps muscle. The surrounding skin tissue appears normal. There is no adenopathy on exam.

CBC and basic chemistries were within normal limits. Differential diagnosis for the nodule included sarcoma, lipoma, sebaceous cyst and many other possibilities. Because of the diagnostic possibilities, the patient was referred to a surgeon who excised the

nodule and it was sent for pathological examination.

### *General Discussion*

Nodular fasciitis is a benign, rapidly growing, reactive proliferation of fibroblasts and myofibroblasts in the subcutaneous tissues<sup>1</sup>. It is sometimes also called pseudosarcomatous fasciitis, proliferative fasciitis, nodular fibrositis, subcutaneous fibromatosis, or infiltrative fasciitis. The proliferation typically results in a palpable solid soft tissue nodule which is 5 -20 mm in diameter.

The lesions are generally solitary, rapidly growing, and are most commonly discovered in the proximal upper and lower extremities of adults and in the head and neck region of infants and children<sup>2</sup>. Nodular fasciitis can also appear in any superficial soft tissue of the body, including the breast, bladder, scrotum, and parotid gland. In the largest study to date, lesions were found most commonly in the forearm (27%) followed by the thigh (17%) and the upper arm (12%)<sup>2</sup>. A history of trauma may precede these reactive lesions, but the cause is often unidentified.

Nodular fasciitis was first described in 1955 by Konwaler who coined the term pseudosarcomatous fibromatosis because these nodules were often confused with sarcomatous lesions<sup>3</sup>.

Nodular fasciitis is most commonly seen in young adults between 30 and 50 years of age

and approximately 10 percent of the lesions occur in children<sup>2</sup>. It is rarely found in adults over the age of 50. Men and women appear equally affected, although in childhood the lesions seem to occur more often in boys.

### ***Symptoms***

Most patients with this reactive proliferation present with a rapidly growing mass over the past few weeks or months. Almost half of patients note that the nodule has been present for less than a month. About one third of patients report pain or tenderness associated with the lesion<sup>4</sup>. As mentioned, the forearm is the most common site for nodular fasciitis in adults. After the upper extremity, the next most common sites of involvement are the lower extremity, the trunk, and the neck. In infants and children, the head and neck region is more commonly involved.

### ***Differential***

The differential for nodular fasciitis is broad but includes both variants of fasciitis and other types of lesions<sup>5</sup>. Variants include intravascular fasciitis, cranial fasciitis, and dermal fasciitis. Other types of lesions in the differential include proliferative myositis, focal myositis, proliferative funiculitis, atypical decubital fibroplasia, fibrous histiocytoma, ischemic fasciitis, inflammatory myofibroblastic lesions, liposarcoma, and fibromyxoid sarcoma<sup>2</sup>.

### ***Diagnosis and Pathology***

Although imaging studies such as sonography, CT, or MRI have been used<sup>6</sup>, diagnosis of nodular fasciitis requires histological confirmation, and both diagnosis and treatment are accomplished by excisional biopsy. Lesions most commonly grow and remain above the fascial plane although there have been reports of lesions

growing into the fascia or muscle tissue<sup>7</sup>. Lesions are often confused with more serious conditions such as sarcomas so careful pathological evaluation is critical. The classic pathologic appearance is a haphazardly arranged bundles of fibroblasts in a myxoid or mucoid background. One also may see a fine capillary network arranged in a radial pattern around a larger central vessel or vessels. Extravasated red blood cells, mitotic figures, undulating wide bands of keloid-like collagen lined by proliferating spindle cells and other signs of hypercellularity are often noted<sup>8</sup>. The fibroblasts are often large and pleomorphic fibroblasts may be present. Mitoses are common but appear normal. Collagen and scattered chronic inflammatory cells are typically present in small to moderate numbers, and older lesions may demonstrate foamy histiocytes and osteoclast-like multinucleated giant cells with multiple nuclei<sup>9</sup>. The nodule does not usually have a capsule but is usually well demarcated from surrounding tissues. Lesions in nodular fasciitis have been separated into 3 types based on a range of histological features: myxoid, cellular and fibrous<sup>2</sup>. The myxoid form tended to have the shortest history and have the most active mitosis on pathology while the fibrous type tends to have the longest history and the cellular group tends to be of intermediate duration<sup>2</sup>.

### ***Causes and Risk Factors***

The cause of nodular fasciitis is unknown but fibroblastic and myofibroblastic proliferation triggered by local injury or a local inflammatory process is generally considered to be the cause in most cases<sup>2</sup>. Recently clonal chromosomal rearrangements have been noted in some cases of nodular fasciitis raising the possibility that such lesions may, in fact, be benign neoplasms<sup>10</sup>.

## Treatment

Once the diagnosis is made by excisional biopsy, no further treatment is typically needed. Spontaneous regression of incompletely excised lesions of nodular fasciitis has also been reported and recurrence is rare<sup>11</sup>.

## Prognosis of Nodular Fasciitis

Despite the sometimes-aggressive appearance of its pathologic features, nodular fasciitis is a benign self-limited condition that rarely recurs, does not develop metastases, and is readily cured by local excision<sup>12</sup>.

## Resolution of Clinical Scenario

The nodule was excised and sent for pathology. Biopsy revealed nodular fasciitis characterized by a stellate-appearing proliferation of fibroblasts dispersed in a collagenous and myxoid stroma. Extravasated erythrocytes and inflammatory cells were also noted as well as benign blood vessels. Fat necrosis was noted at the periphery. Scattered mitoses were easily identified but atypical mitoses were not prominent. It was recommended that the surgical site be observed over time for recurrence. Given the diagnosis, the patient was questioned about possible prior trauma to the leg and he recalled being accidentally kicked in the leg by his three-year-old son during a beach trip the week before he noticed the nodule. It was felt that the injury may have been the precipitant for the development of the nodular fasciitis.

## Take Away Pearls

1. Nodular fasciitis is an underappreciated cause of subcutaneous nodules especially in young adults.

2. The typical clinical presentation is a precipitating injury and subsequent discovery of a relatively painless, mobile subcutaneous nodule in one of the extremities or neck region.
3. Although imaging studies are occasionally used, diagnosis is typically made by surgical excision and pathological interpretation.
4. Most cases are definitively treated with such excision and recurrences are rare.

## REFERENCES

1. **Grobmyer SR, Knapik JA, Foss RM, Copeland EM, Hochwald SN.** Nodular fasciitis: differential considerations and current management strategies. *Am Surg.* 2009 Jul;75(7):610-4.
2. **Shimizu S, Hashimoto H, Enjoji M.** Nodular fasciitis: an analysis of 250 patients. *Pathology.* 1984 Apr;16(2):161-6.
3. **Kleinstiver BJ, Rodriguez HA.** Nodular fasciitis. A study of forty-five cases and review of the literature. *J Bone Joint Surg Am.* 1968 Sep;50(6):1204-12.
4. **Hutter RV, Stewart FW, Foote FW Jr.** Fasciitis. A report of 70 cases with follow-up proving the benignity of the lesion. *Cancer.* 1962 Sep-Oct;15:992-1003.
5. **Sasano H, Yamaki H, Ohashi Y, Ohtsuki S, Nagura H.** Proliferative fasciitis of the forearm: case report with immunohistochemical, ultrastructural and DNA ploidy studies and a review of the literature. *Pathol Int.* 1998 Jun;48(6):486-90.
6. **Leung LY, Shu SJ, Chan AC, Chan MK, Chan CH.** Nodular fasciitis: MRI appearance and literature review. *Skeletal Radiol.* 2002 Jan;31(1):9-13. Epub 2001 Aug 30.
7. **Price SK, Kahn LB, Saxe N.** Dermal and intravascular fasciitis. Unusual variants of nodular fasciitis. *Am J Dermatopathol.* 1993 Dec;15(6):539-43.
8. **Dahl I, Angervall L.** Pseudosarcomatous proliferative lesions of soft tissue with or without bone formations. *Acta Pathol Microbiol Scand A.* 1977 Sep;85(5):577-89.
9. **Montgomery EA, Meis JM.** Nodular fasciitis. Its morphologic spectrum and immunohistochemical profile. *Am J Surg Pathol.* 1991 Oct;15(10):942-8.
10. **Donner LR, Silva T, Dobin SM.** Clonal rearrangement of 15p11.2, 16p11.2, and 16p13.3 in a case of nodular fasciitis: additional evidence favoring nodular fasciitis as a benign neoplasm and not a reactive tumefaction. *Cancer Genet Cytogenet.* 2002 Dec;139(2):138-40.
11. **Diaz-Flores L, Martin Herrera AI, Garcia Montelongo R, Gutierrez Garcia R.** Proliferative fasciitis: ultrastructure and histogenesis. *J Cutan Pathol.* 1989 Apr;16(2):85-92.
12. **Bernstein KE, Lattes R.** Nodular (pseudosarcomatous) fasciitis, a nonrecurrent lesion: clinicopathologic study of 134 cases. *Cancer.* 1982 Apr 15;49(8):1668-78.

Submitted on July 21, 2011