Proliferative fasciitis: A rare cause of disturbances in an adolescent hand

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ABSTRACT

We report a case of hand soft tissue tumor-proliferative fasciitis (PF)-in a 12-year-old patient that presented as a painful lump causing trigger finger. After meticulous diagnostic workup, a surgical excision led to immediate amelioration of symptoms. PF is a rare benign pseudosarcomatous lesion arising typically in the subcutaneous tissue and fascia in adults. It is very uncommon in the hand. To the best of our knowledge, this is the first report of a trigger finger being caused due to this pathology. In this report, the authors review PF lesions on hands, advice careful evaluation of magnetic resonance imaging features, and recommend surgical management.

Proliferative fasciitis (PF) is a benign and solid pseudosarcomatous reactive lesion of the soft tissue characterized by rapid growth (1-3). It usually occurs in adults aged between 40 and 70 years. PF is very uncommon in children and adolescents. Most lesions occur in the fascia and subcutaneous tissue of the extremities, with predominance in the upper extremity (1, 2). However, PF is exceedingly rare in the hand, with just seven cases reported so far (4-9). To the best of our knowledge, a case of hand PF causing trigger finger has not yet been published. Informed consent was obtained from the patient’s parent to be included in this report.

Case Presentation

A 12-year-old boy presented to us complaining about finger catching and locking with associated pain in the volar side of the left hand. He reported minor trauma to the left hand 3 months ago. A firm lump was palpated in the proximal part of the third intermetacarpal space. All fingers had full range of motion but triggering accompanied flexion of the index, long, and ring fingers. Trigger finger was suspected due to palm tumor in zone 3. Plain radiographs were uninformative, and ultrasound showed a round, well-circumscribed soft tissue mass. Magnetic resonance imaging (MRI) revealed an oval tumor between the flexor tendons of the second and third fingers at the level of the metacarpal diaphysis (Figure 1). Differential diagnoses included nodular fasciitis, fibroma of tendon sheath, schwannoma, or leiomyoma. Given the imaging characteristics, mechanical difficulties, and pain, excision was recommended. Using a volar approach, surgical exposure revealed a tumor that arose from a tendon sheath of the deep flexor muscle to the long finger (Figure 2a). During flexion, the tumor moved and impinged on the distal margin of the transverse carpal ligament. The tumor was removed in its entirety. The tumor was pale white in color, elliptical in shape, and measured 2.0×1.5×1.0 cm (Figure 2b).

Histopathologically, the tumor was poorly circumscribed and composed of plump spindle cells arranged in short fascicles admixed with large ganglion-like cells set in fibrocollagenous stroma (Figure 2c). Ganglion-like cells were polygonal or elongated with abundant eosinophilic to amphophilic cytoplasm, one or two slightly eccentric vesicular nuclei, and prominent nucleoli (Figure 2d). Immunohistochemically, the tumor cells were positive for smooth muscle actin and focally for CD68, but negative for desmin, h-caldesmon, beta-catenin, CD34, and S100. On the basis of histological and immunohistochemical analyses, the diagnosis of PF was established. The postoperative course was uneventful with immediate cessation of triggering and pain. At the latest follow-up visit, 3 years postoperatively, there was no evidence of local recurrence, and the patient had no further complaints.

Discussion

PF is a rare benign pseudosarcomatous lesion. The usual presentation is a firm palpable subcutaneous lump that is mobile and unattached to the overlying skin. Although mechanical trauma has been implicated, the true etiology of PF remains unknown. In most patients, PF grows rapidly for a few weeks, and for that reason, the lesion could be often confused with a...
sarcoma (4). Over 50% of cases of PF appears in the extremities, with predominance in the upper extremity (1, 2). However, reports on PF in hands are rare (4-9).

Chung and Enzinger first reported two cases of PF involving the hand. Altogether, authors reported 53 cases of PF but did not clearly specify symptoms for each case. In their report, PF was mostly situated subcutaneously and it was painful in about two-thirds of patients. In almost one-third of these patients, the lesion had been initially confused with sarcoma due to its rapid growth and bizarre histological features. Although they had one case of recurrence, the authors recommended local excision for these lesions (4).

In the last 30 years, only three separate cases of PF in an adult hand have been reported. All cases presented either as a painful nodule or swollen digit, treated with excisional biopsy, and all remained recurrence-free (6-8).

Here, however, we described PF in an adolescent hand. The first PF on a nonadult hand was reported by Lorenc et al. in 1987 (5). Theretofore, PF was observed exclusively in adults. Authors described a case of a 7-year-old child with a mildly tender lump on the distal palm. Unlike our case, there was no prior trauma involved (5). Recently, Sfoungaris et al. reported PF in a pediatric hand, presented first as painless red papule on the long finger (9). Prior trauma was involved in this case, and in few weeks, the lesion became painful, red, and increased in size. In both cases, surgical excision was performed, and no recurrence was noted (5, 9).

According to the literature, hand PF usually presents as a painful lump, with redness and a rapid increase in size. Therefore, this report is the first study on a rare location of this clinical entity that presented with the mechanical symptoms such as trigger finger.

In our study preoperative MRI workup was used. Since there was no diffusion restriction on diffusion-weighted imaging and apparent diffusion coefficient map, we judged the tumor as benign based on a previous report of Maeda et al (10). In that study, authors found that malignant tumors had more cellularity than benign tumors, and therefore tended to have restricted diffusion (10).

Generally, soft tissue tumors of the hand are likely to be benign with the major differential diagnoses for nodular fasciitis (11).

However, according to Sookur and Saifuddin, imaging features of PF have not been well characterized so far (12). Thus, PF is difficult to discriminate from malignant tumors around the hand and wrist (12). Therefore, it is not surprising that there have been reports of misdiagnosis and excessive, unnecessary treatment in cases of PF,

**HIGHLIGHTS**

- Proliferative fasciitis should be considered in the differential diagnosis of hand tumors.
- Magnetic resonance imaging is an obligatory radiological assessment of the soft tissue lesions on hands.
- Complete surgical excision is the advised treatment of proliferative fasciitis on hands.
- An experienced pathologist should evaluate material suspected for proliferative fasciitis.

**Figure 1. a-e. Preoperative MRI of the left hand**
Coronal plane T1w precontrast image shows the lesion with a low signal intensity, similar to surrounding muscles (a). Coronal plane T1w image after administration of the contrast medium (Dotarem) shows homogeneous high signal enhancement of the lesion (b). Axial plane PD BLADE sequence shows oval, high signal intensity lesion between flexor tendons (c). Axial plane diffusion-weighted image, (b=800 s/mm²) shows high signal intensity within the lesion (d). Axial plane apparent diffusion coefficient map also shows high signal intensity indicating there is no diffusion restriction in the hand lesion (e)
especially if the histopathological analysis was not performed by an experienced pathologist (13).

In our case, histopathological analysis showed the presence of large ganglion-like cells set in fibrocollagenous stroma, a distinctive feature of PF in comparison to nodular fasciitis, the more frequent benign soft tissue tumor found in the hand (1, 2, 11).

Surgical excision is shown to be the most common treatment for PF (1). Oddly, in one case of PF on the forearm, the lesion involuted after a needle biopsy and authors advocated for conservative treatment of such lesions (3).

**Conclusion**

In this study, we report a unique case of PF presenting as palm lump and painful trigger finger in an adolescent hand. In order to elucidate the diagnostic dilemma, we advise MRI tumor characterization to be included in the workup. If hand PF is suspected, we recommend complete surgical removal and expect meticulous histopathological analysis to confirm the diagnosis.

**Informed Consent:** Written informed consent was obtained from the patient’s parent in the case.

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