Case Report

Reactive Nodular Fibrous Pseudotumor Presenting as a Huge Intra abdominal Mass after Abdominal Surgery: a Case Report

Birgul Ciftci[1], Enver Vardar[1], Funda Tasli[1], Savas Yakan[2], Erdinc Top[1], Mehmet Yildirim[2]

1. Dept. Of Pathology, Izmir Bozyaka Training and Research Hospital, Izmir, Turkey
2. Dept. Of Surgery, Izmir Bozyaka Training and Research Hospital, Izmir, Turkey

ABSTRACT

Although the majority of mesenchymal lesions of the gastrointestinal tract are neoplastic in nature, but nonneoplastic reactive processes may also involve the gastrointestinal tract and mesentery. Some more aggressive neoplasms located in same area, such as fibromatosis or gastrointestinal stromal tumors may be cause of diagnostic confusion. Reactive nodular fibrous pseudo tumor (RNFP) of the gastrointestinal tract and mesentery is a recently recognized entity. Here we present one such lesion in 71 years-old- man with a history of abdominal surgery. The tumor was firm, tan–white colored, ranged in size 19.5 cm in greatest dimension, and was grossly well circumscribed. Histologically it is composed of spindle-shaped cells resembling fibroblasts arranged haphazardly or in intersecting fascicles, embedded in a collagen-rich stroma with sparse intralesional lymphoid cells frequently arranged in aggregates. We present a case of this entity have largest tumor and also due to the rarity.

Keywords: **Reactive Nodular Fibrous Pseudotumor, Abdomen, Tumor**

Introduction

Mesenchymal tumors that arise within the abdominal cavity, including the gastrointestinal tract, mesentery, and retro peritoneum, represent a heterogeneous group of entities that pose diagnostic difficulty to both surgical pathologists and clinicians. Benign mesenchymal tumors and pseudotumors of the gastrointestinal tract include various lesions with different prognoses. Distinguishing between them is important because there are significant differences in their biologic potential and treatment. Reactive nodular fibrous pseudotumors (RNFP) of the gastrointestinal tract

Received: 04 Oct 2013
Accepted: 26 Mar 2014
Address Communications to: Dr. Birgul Ciftci, Department Of Pathology, Izmir Bozyaka Training and Research Hospital, Izmir, Turkey.
Email: gri-36@hotmail.com

and mesentery were defined in 2003 by Yantiss *et al.* (1). It is characterized as reactive because of its association with a history of abdominal surgery, injury, or inflammation (1, 2).

To date, only 19 cases have been reported in the Western literature, with almost all being described in adults who present with insidious abdominal symptoms. Here we present one such lesion in 71-years-old man were operated with insidious abdominal symptoms.

Case Report

Thoraco-abdominal CT and MRI scan revealed a mass in 71-year-old man with history of abdominal surgery due to colon adenocarcinoma (Fig.1). The abdominal mass was detected in follow-up abdomen CT of the patient, incidentally. Laparotomy was performed due to the presence of the abdominal mass located between the diaphragm, transverse colon and stomach. Intraabdominal solid mass was excised from diaphragm and transverse colon after ligation of vascular structures between serosa of transverse colon. Pathologic evaluation revealed an encapsulated mass sized in 19.5×19×8 cm. Serial sections of the mass were tan-gray colored with areas of focal hemorrhage (Fig. 2). Histologically, the lesion was characterized by a paucicellular to moderately cellular proliferation of spindle-shaped cells enmeshed in a collagenous matrix similar to cell culture, which was hyalinized appearance (Fig. 3). The neoplastic cells were arranged in haphazard, poorly formed fascicles or loose aggregates and were frequently associated with focally mononuclear cell inflammatory infiltrate. Additionally, several foreign body type multinucleated giant cells have been found in serial sections (Fig. 4). Long, regular, sweeping fascicles of cells were not seen in haematoxylin-eosin stained slides. Very rare mitotic figures were identified (<1/50 high power fields) and were usually seen in areas of increased cellularity. Atypical nuclear changes, calcifications and necrosis were not identified.

Immunohistochemical study showed the expression of vimentin (Fig. 5) in most of the spindle cells and smooth muscle actin (Fig. 6), focally in formalin fixed-paraffin embedded tissue sections. There were no staining for cytokeratin, EMA, the neurofilament, S100, synaptophysin, p63, CD117 (c-kit), CD34, desmin, or anaplastic lymphoma kinase (ALK-1). Immunohistochemical staining results were given in Table 1. Excision was complete, and no evidence of disease was found 8 months later.

Table 1- Antibodies used in the presented case for evaluation of intra-abdominal mass

Antibody	Clone	Result
Vimentin	V9	Positive
CD117	Polyclonal	Negative
Smooth muscle actin	HHF35	Focal Positive
Desmin	D33	Negative
ALK-1	Polyclonal	Negative
CD34	QBend10	Negative
Cytokeratin	AE1/AE3	Negative
p53	DO7	Negative
Ki67	MIB-1	Negative
S100	Polyclonal	Negative
p63	4A4	Negative
EMA	E29	Negative
D2-40	D2-40	Negative

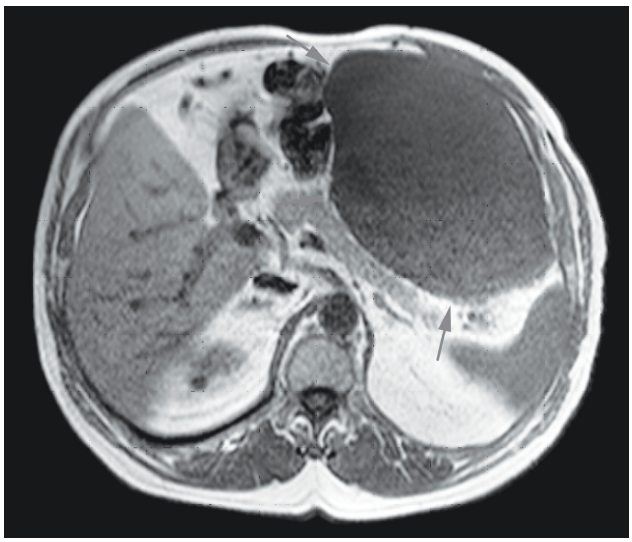

Fig. 1: MRI view huge, solid, homogeneous lesion (arrow) seen in right and the liver in left zone of the image

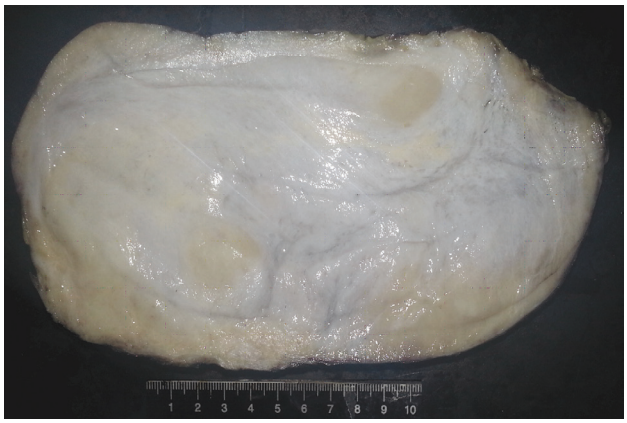

Fig. 2: Gross view of excised specimen in cut section. Note solid minimally heterogeneous tumor with grayish white colour and yellow areas

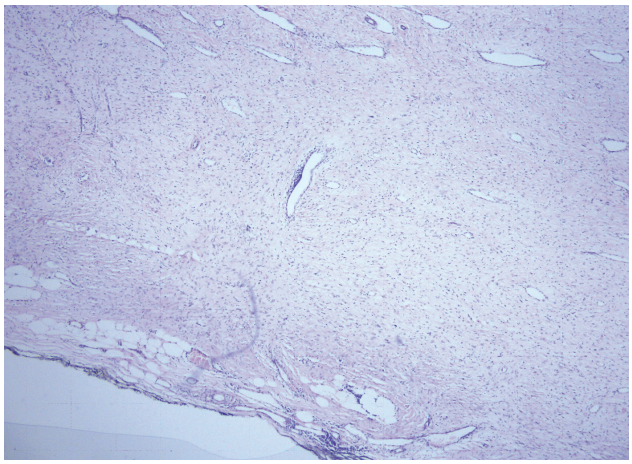

Fig. 3: Few vascular structures, relatively hypocellular areas in loose background were seen and also some adipocytes, a lymphoid collection present in peripheral region. (H&E ×100)

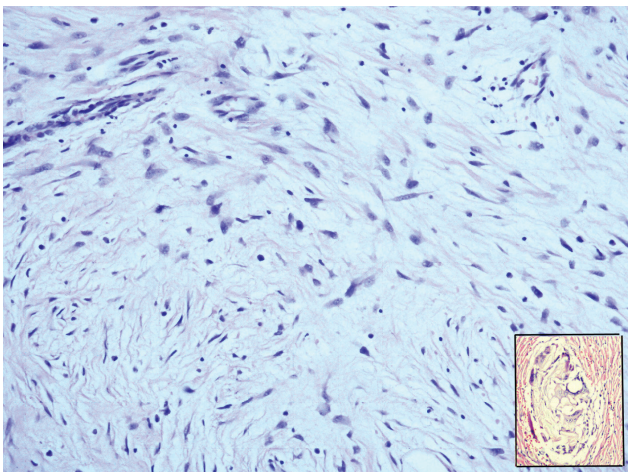

Fig. 4: Reactive nodular fibrous pseudotumor chiefly composed of a uniformly dense collagenous matrix interspersed among scattered stellate, spindle-shaped and inflammatory cells and note foreign body type multinucleated giant cell (inset). (H&E ×200)

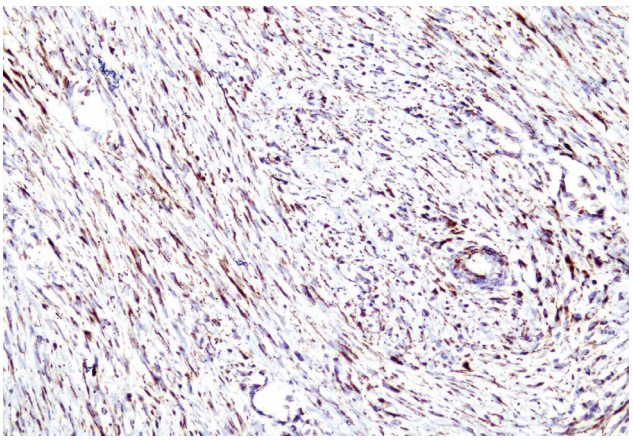

Fig. 5: Diffuse vimentin positivity was seen. (vimentin immunohistochemistry ×200)

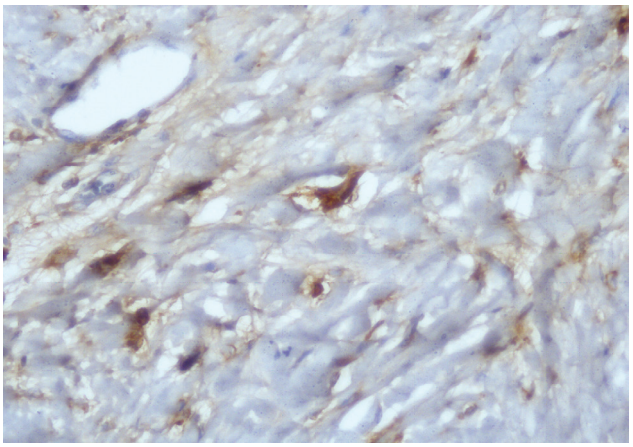

Fig. 6: Focal smooth actin positivity was seen. (smooth muscle actin immunohistochemistry ×400)

Discussion

Reactive nodular fibrous pseudotumor is a benign post inflammatory myofibroblastic lesion recently described (1). It typically arises from the subserosal surface of the bowel or within the surrounding mesentery in association with mostly local injury or inflammation. The typical localizations are colon, small bowel, appendix, mesentery, omentum, peripancreatic fat and ovaries and given in decreasing frequency. The first report described five such tumors in adult patients presenting in the gastrointestinal tract and mesentery. The age distribution in the literature is almost exclusively in adults (age range, 22-72 years) except for a single case in a 1-year-old boy (3). Among the eight patients with an available medical history, four had a history of abdominal surgery similar to our case (4). This is the fifth case has a history of abdominal surgery in the literature. Morphological findings in all cases were very similar. Macroscopically lesions were firm or elastic, homogeneous, and serial sections were white, gray or yellowish tan colored. In Western literature, the largest lesion measured 10 cm in diameter and our case represents the 20th report and was 19.5 cm in the largest size (5).

Microscopic examination of RNFP shows a pauci- or moderately cellular proliferation of spindle cells, in a dense collagenous background, with hyalinized tissue. These cells are arranged in poorly-formed, short fascicles or have scattered pattern. Only 1-2 mitotic figures were seen totally in high power field examination similar to other reports. There are no atypical nuclei, but we see several minimally pleomorphic nuclei. Calcifications of concentric hyaline whorls and focal necrosis were found in one case (5). In our case, the lesion demonstrated low cellularity, prominent hyalinization and minimal atypia, but no necrosis and calcification were seen. Sparse inflammatory cells were reported in most of the cases which are mostly lymphoid cells, and frequently arranged in lymphoid aggregates. Also, there were three lesions that contained foreign body type giant cells (5, 6). In our case, the lesion also showed both lymphoid aggregates and foreign body type giant cells possibly due to previous surgical intervention applied for colon neoplasm five years ago. The features used to characterize RFNP and differentiate it from other spindle cell lesions are by, in large, Immunohistochemical and suggest that RFNP is possibly derived from multipotent subserosal progenitor cells (6, 7). All cases described in the literature have been uniformly positive for vimentin, and most have stained positive for smooth muscle actin (SMA) (4). In cases have been reported, and our case, spindle cells were positive for vimentin and SMA similar to previous cases presented in the literature, but pancytokeratin was not immunoreactive in our case contrary to some case reports. Cytokeratin was positive only 7 cases in the 19 cases presented previously (4).

Fibroinflammatory tumors, or inflammatory pseudotumors, of the mesentery and gastrointestinal tract have been the subject of several reports (1). However, in most instances, the tumors reported represent a heterogeneous group of clinically and biologically distinct entities, including calcifying fibrous pseudotumor, GIST, inflammatory myofibroblastic tumor, inflammatory fibrosarcoma, sclerosing mesenteritis, and other non neoplastic fibrous proliferations. Many of these lesions, including fibromatosis, are in the differential diagnosis of RNFP. In most cases, the distinction among these entities relies heavily on their morphologic features, but ultrastructural and immunohistochemical analyses sometimes will be necessary to discriminate between them (8). In our case the lesion presented most of the spindle cells of vimentin and smooth muscle actin. There was no staining for pancytokeratin, CD117, CD34, desmin, or anaplastic lymphoma kinase (ALK-1).

Calcifying fibrous pseudotumor is a benign soft tissue lesion that is also known to present in similar locations such as stomach, omentum

and mesentery, can also be considered in the differential diagnosis (9, 10). CFP is relatively well-circumscribed similar to RNFP, but may occasionally have infiltrative borders (9). It is composed of a hypocellular spindle cell proliferation within dense stromal collagen, and a lymphocyte and plasma cell infiltrate with lymphoid aggregates, but also intermingled with whorled collagen, numerous psammomatous and dystrophic calcifications (9, 11). Differential diagnosis between CFP and RNFP based on their immunohistochemical features. It is also characterized by a hypocellular spindle cell proliferation (CD34 positive, but smooth muscle actin and muscle specific actin negative) within dense collagen, accompanied by dystrophic calcification (4, 10). In the presented case, no psammomatous and dystrophic calcifications were seen and also spindle cells were positive for smooth muscle actin, but negative for CD34 and cytokeratin.

Because of the potential aggressive progression of GIST, it is one of the most important differential diagnoses to be made for RNFP. In contrast to RNFP originating predominantly in the subserosa, GIST is centered in the muscularis propria in most cases, although it can occur in extraintestinal locations as well (11). GIST tends to be more cellular than RNFP and composed of spindle and/or epithelioid cells showing strong positivity with the antibody against CD117 and approximately 70% of GISTs also positive for CD34 (12). Our case was located in extragastrointestinal compartment and was negative for CD117 and CD34, immunohistochemically.

Inflammatory myofibroblastic tumors and related lesions have a strong tendency to recur locally, and must also be distinguished from RNFP. Unlike RNFP, this lesion typically affects children or young people and typically associated with systemic manifestations such as elevated leukocyte count and erythrocyte sedimentation rate. Moreover, it is characterized by a high propensity to locally recur and (although uncommonly) metastasize (13). Histologically, these tumors are often hypercellular and characterized with loosely arranged fascicles of ALK-1 positive spindle cells with some cytological atypia, frequent mitoses and abundant eosinophilic cytoplasm meshed in a collagenous, edematous or myxoid stroma containing abundant lymphoplasmacytic infiltrates (14). In RNFP, negativity of ALK-1 in these lesions will be helpful in the differential diagnosis. Finally, sarcomatoid carcinoma is composed of fusiform cells positive with vimentin and cytokeratin, but the constant presence of atypical nuclei helps distinguish it from RNFP.

We believe that the macroscopic and histopathologic features of our case most closely resemble the RNFP. All the differential diagnostic lesions we have discussed are similar in nature and represent reactive fibrous proliferations, most probably in response to various conditions that irritate the peritoneum, and seem to be derived from multipotent subserosal cells. In RNFP, some authors claimed that spindle cells originated from multipotent subserosal cells based on their CK expression (15). Our case likely represents typical RNFP with more extensive involvement of the serosal surface which we believed is of a reactive nature due to surgery and best described by the term “reactive nodular fibrous pseudotumor”.

Conclusion

RNFP is a postinflammatory lesion that is now increasingly recognized in the differential of primary gastrointestinal tumors. The present case represents the largest sized tumor recognized as RNFP in the reported cases. Such lesions should be included in the differential diagnosis especially in the setting of an intraabdominal mass on imaging studies. Localization, morphological, immunohistochemical and ultrastructural features suggest that RNFP is a proliferation derived from multipotent subserosal cells. This diagnosis should be kept in mind by both clinicians and pathologists when confronted with unique

or multiple nodular subserosal fibrous lesions of the gastrointestinal tract, especially in case of previous abdominal surgery. Indeed, RNFP does not recur after simple excision, unlike some of its main differential diagnoses, such as GIST, inflammatory myofibroblastic tumor and intra-abdominal fibromatosis. It is important to differentiate RNFP from similar lesions with more aggressive biology, because RNFP can be managed definitively with local resection and reassurance.

Acknowledgements

The authors declare that there is no conflict of interests.

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