British Journal of Medicine & Medical Research
11(7): 1-7, 2016, Article no.BJMMR.21438
ISSN: 2231-0614, NLM ID: 101570965

SCIENCEDOMAIN *international*
www.sciencedomain.org

Ileo-ileal Intussusception Caused by Primary Monophasic Synovial Sarcoma (SS) of the Ileum

Ernesto Di Cesare[1*], Irene Amicarelli[2], Alessandra Di Sibio[2], Antonio Gennarelli[2], Valentina Felli[2], Valentina Vellucci[2], Marco Perri[2], Claudia Marsecano[2], Giulia Michelini[2], Giovanni Fuccio Sanzà[3], Alessandra Splendiani[2] and Carlo Masciocchi[2]

[1]Department of Biotechnology and Applied Clinical Sciences, Division of Radiotherapy and Cardiac Radiology, San Salvatore Hospital, University of L'Aquila, L. Natali Street 1, 67100 L'Aquila, Italy.
[2]Department of Biotechnology and Applied Clinical Sciences, Division of Radiology, San Salvatore Hospital, University of L'Aquila, L. Natali Street 1, 67100 L'Aquila, Italy.
[3]Radiodiagnostic and Radiotherapy Unit, University Hospital 'Policlinico Vittorio Emanuele', Santa Sofia Street 78, 95123 Catania, Italy.

Authors' contributions

This work was carried out in collaboration between all authors. Authors IA, ADS, AG and VF wrote the first draft of the manuscript. Authors VV, MP, CM and GFS did the literature searches. Authors AS, EDC and CM managed the work. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/21438
Editor(s):
(1) Alex Xiucheng Fan, Department of Biochemistry and Molecular Biology, University of Florida, USA.
Reviewers:
(1) Anthony Cemaluk C. Egbuonu, Michael Okpara University of Agriculture Umudike, Nigeria.
(2) Gene P. Siegal, University of Alabama, USA.
(3) T. S. Mahesh Kumar, Rajarajeswari Dental College and Hospital, India.
Complete Peer review History: http://sciencedomain.org/review-history/11734

Case Study

Received 16th August 2015
Accepted 22nd September 2015
Published 7th October 2015

ABSTRACT

Synovial Sarcoma (SS) is an uncommon neoplasm, very rare in gastrointestinal tract. We report a case of 57 years old man who reported a previous diagnosis of primary left atrial leiomyosarcoma referred for a follow-up CT, that showed findings compatible with ileo-ileal intussusception. The patient underwent surgical resection and pathological analysis showed that the lead point of intussusception were two polypoid lesions referable to SS. The present case report suggests that, although the incidence of SS is rare, it should be considered in the differential diagnosis of any gastrointestinal non-epithelial malignancy.

**Corresponding author: Email: ernesto.dicesare@cc.univaq.it;*

Keywords: Synovial sarcoma; intussusception; SYT gene; SYT-SSX fusion gene.

1. AIM

Synovial Sarcoma (SS) is a rare entity, which represents 1% of all cancer diagnosed annually in the United States and 5 - 10% of all soft tissue sarcomas. SS arises more often in para-articular regions around the major joints (mainly around the knee) or tendon sheaths. Occasionally, SS arises in the head and neck, lungs, heart, retroperitoneum, prostate, mediastinum, the abdominal wall and the retroperitoneum. Gastrointestinal SS is extremely rare and mainly affects the esophagus. We report a very rare case of primary monophasic Sinovial Sarcoma (SS) arising from the ileum and causing an ileo-ileal intussusception; the diagnosis was confirmed by the detection of SYT-SSX fusion gene transcripts using the Fluorescence In Situ (FISH) hybridization. To the best of our knowledge, our case is the fourth reported case of ileal SS and the first causing an ileo-ileal intussusception.

2. PRESENTATION OF CASE

A 57-years-old male patient reported was seen in our service for a routine follow-up CT. During the last 3-4 days he had experienced progressively worsening diffuse abdominal cramping pain associated with mild abdominal distension, nausea and vomiting, and no history of fever.

He had a previous diagnosis of primary left atrial leiomyosarcoma diagnosed three years before and was treated with a complete surgical resection via median sternotomy, followed by chemotherapy (Doxorubicin and Isofosfamid) and external radiotherapy. The histopathology revealed a 2cm mass arising from the lateral wall of the left atrium with intracavitary extension. The margins of the excised mass were free of infiltrative disease; there was no extension into the pericardium or other adjacent structures.

On examination, he was alert and conscious. His vital signs were stable. Physical examination revealed diffuse abdominal tenderness, with no guarding or rebound tenderness.

A contrast enhanced chest, abdomen and pelvis Computed Tomography (CT) was performed using a 640 – slice scanner (Toshiba Medical Systems, Tochiki-ken, Japan) during the arterial and portal venous phases. CT scan of abdomen and pelvis showed two slightly dilated ileal tracts with a “bowel within bowel” appearance, measuring respectively 4cm and 4.5 cm, that were suspicious of ileo-ileal intussusception (Fig. 1). Some dilatation of the proximal small bowel loops was also seen.

A segmental resection of small bowel, that included the masses and adjacent mesentery, and a primary latero - lateral anastomosis were performed.

The macroscopic examination of surgical specimen revealed two polypoid and ulcerated masses, measuring respectively 4 and 3.8cm, which arise from the wall of ileum making the lead point of intussusceptions (Fig. 2). Microscopically, the lesions were hypercellular and showed a monomorphic population of spindle-shaped cells, arranged in fascicles, with whorled pattern in some areas. No epithelial components were identified. These findings indicated the possibility of well-differentiated mesenchymal tumors.

The neoplasms infiltrated the entire bowel wall, with non involvement of the serosa. The luminal surface of the tumors was covered only in part with normal intestinal mucosa with wide ulceration. Surgical margins were negative.

The tumor was immunohistochemically negative for c-kit (CD117), a marker suggestive of gastrointestinal stromal tumor (GIST), and for the smooth muscle markers, which are characteristic of leiomyosarcomas. Fluorescence in situ hybridization (FISH) showed the rearrangement of the SYT gene, confirming the diagnosis of synovial sarcoma, monophasic type.

Patient tolerated the small bowel resection very well and postoperative recovery was unremarkable. The patient was not offered any adjuvant treatment because, although he was more than 25 years old, each lesion was less than 5 cm, confined to the bowel wall without serosal involvement, with well-differentiated histology and negative resection margins. No recurrence of the lesion was detected on follow-up visits over a period of 20 months after the intestinal lesion and 56 months after the atrial one.

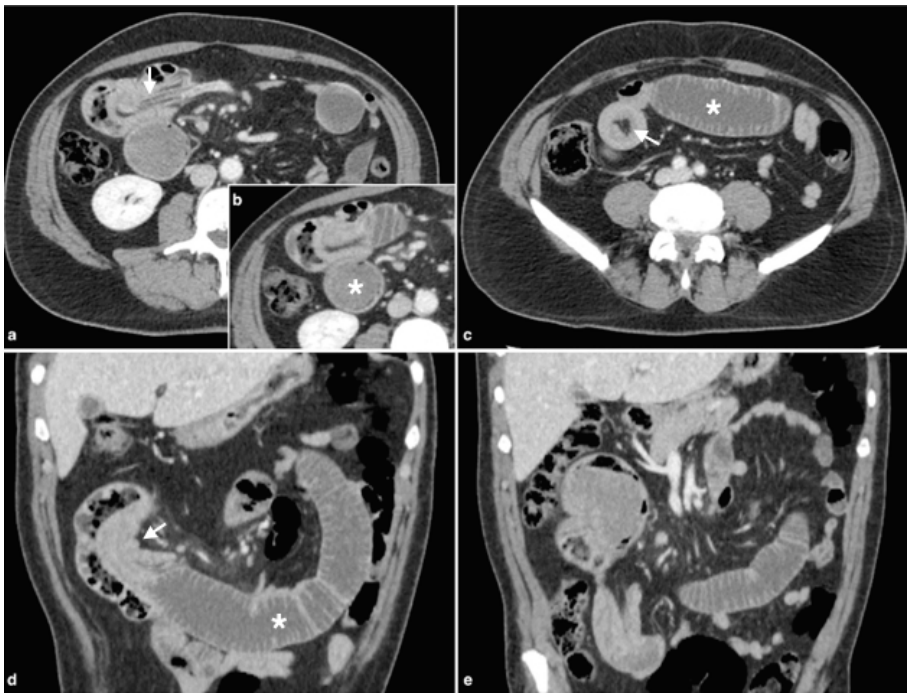

Fig. 1. Axial CT demonstrates an ileo-ileal intussusception with stretching of the mesenteric vessels (arrow in a) and slight dilatation of the proximal bowel loop (asterisk in b and c). Axial CT (c) shows a target like feature of the bowel loop with a 'bowel within bowel' appearance due to an eccentric crescentic area of intraluminal fat representing intussuscepted mesenteric fat (arrow). Coronal CT reconstruction (d and e) demonstrate the bowel in bowel features of the intussuscepted loop (arrow in d) with mild dilation of the proximal bowel (asterisk in d)

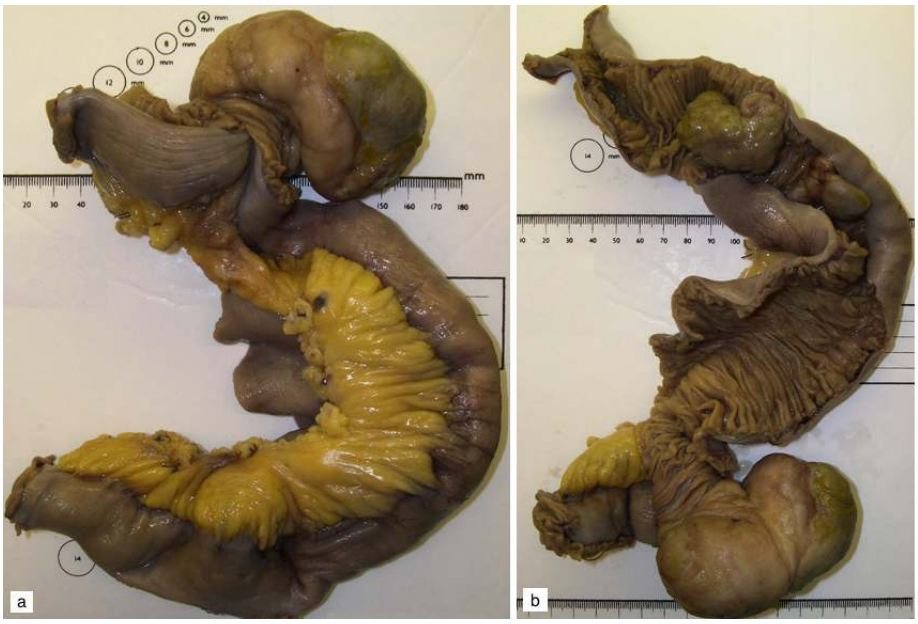

Fig. 2. Gross surgical specimen (a) shows the ileo-ileal intussusception. The opened intussusceptum (b) shows the two tumor presenting as polypoid masses with an intracavitary growth making the lead point of intussusception

Institutional review board approval was obtained and the patient provided informed consent for publication of this case report and any accompanying images.

3. DISCUSSION

An intussusception is defined as the penetration of an intestinal segment, and its mesentery, in the downstream segment. Intussusception is uncommon in adults, accounting for 1-5% of adult bowel obstruction [1]; 90% of all adult intussusceptions are secondary to lesion of the intestinal wall [2]. More specifically, 63% of adult small intestinal intussusception cases are associated with benign lesions, 23% cases are idiopathic and 14% cases are associated with malignant lesions. Primary malignant tumors of the small intestine are very rare, accounting for less than 2% of all gastrointestinal malignancies. Malignant lesions resulting in intussusception in the small intestine include primary adenocarcinoma, gastrointestinal stromal tumors (GISTs), lymphoma and carcinoid tumors [1].

CT scan is the most useful preoperative diagnostic modalities in the diagnosis of bowel obstruction and intussusception [1]. The most common CT finding in early stages is a thickened segment of bowel with a round "target" mass, showing an eccentrically placed crescent-like fatty area (bowel within bowel), representing the intussusception and the intussuscepted mesentery [1], as in the present case.

Synovial Sarcoma (SS) is a rare entity, representing 1% of all cancers that are diagnosed annually in the United States and 5 - 10% of all soft tissue sarcomas [3, 4]; the annual international incidence rate of all soft tissue sarcomas is between 1.4 and 5 cases per 100,000 [5]. 85-95% of SS cases occurs in the extremities [6], rarely (less than 5%) in an intra articular location [7], more often in the para-articular regions [8] around the major joints (mainly around the knee) or tendon sheaths [3,7]. Occasionally (5–10%), SS arises in the head and neck, lungs, heart, retroperitoneum, prostate and intra-neurally [3], mediastinum, the abdominal wall and the retroperitoneum [6]. Gastrointestinal SS is extremely rare and mainly affects the esophagus [3]. To the best of our knowledge, there have been only 3 reported cases of synovial sarcoma arising in the ileum [3,9] and this is the first reported case of an ileal SS causing an intussusception.

Despite its name, SS does not originate from synovial tissue, but from an unknown multipotent stem cells that differentiate into mesenchymal and/or epithelial structures [10]. The nomenclature is, therefore, a misnomer [11]; SS was erroneously deemed a tumor of synovial differentiation because its morphology resembles the developing synovial tissue [7].

SS is a malignant soft tissue neoplasm which may display variable epithelial differentiation [7] and has three major histological subtypes: the biphasic, monophasic and poorly differentiated types [10]. The monophasic type is entirely composed of spindle-shaped cells [7,10], as in the present case; the biphasic type is constituted by both spindle- shaped cells and epithelial cells [7]. The poorly differentiated subtype is a variant that lacks spindle cells and comprises primitive small round cells [10].

GI tract SS tend to remain asymptomatic for long time; the presenting symptoms are vague and non-specific including abdominal pain, fullness, bloated sensation, dyspepsia, weight loss, asthenia or obstruction [3], as in the present case.

Radiological findings of SS are not pathognomonic and the diagnosis is based on the pathological characteristics of the specimen [12]. Cross-sectional imaging features (CT and MRI) are essential for defines the mass extent, the staging of the tumor and its complication (eg intussusception), in order to correctly plan the surgical resection [12].

Prognosis of primary SS in the gastrointestinal tract is unclear because of the too small number of the cases [7]: the survival period after diagnosis ranged from 1 to 224 months [3], the 5-year survival rate ranges from 25.2% to 62.5%, whereas the 10-year survival rate ranges from 11.2% to 30% [13]. Patients with SS are divided into low-risk and high-risk groups depending on their age, tumor size and grade as follows: low-risk group (patient age < 25 years, tumor size < 5 cm and no histologic evidence of poorly differentiated tumor); high-risk group (patient age approximately 25 years, tumor size approximately 5 cm and poorly differentiated tumor) [3]. A low-risk group has 88% disease-free survival and high-risk group has 18% disease-free survival [14].

Based on the results for synovial sarcoma of the extremities, surgical excision with a wide margin is the only curative therapy and offers the best outcome; however, the application to intra abdominal cases is largely unstudied [15]. Recently, the French Sarcoma group reported in their retrospective study about the effect of neo/adjuvant chemotherapy in resected SS of the extremities and stated that chemotherapy does not improve the outcome in the localized setting [4,16]. Thus, the role of adjuvant chemotherapy in patients with localized disease after local excision remains unproven [4].

The patient had a history of primary left atrial leiomyosarcoma, which is an extremely rare disease, accounting for 0.019% of all malignant cardiac neoplasms in autopsy studies, but nevertheless represents the second most common type of primary cardiac neoplasm [17]. Prognosis is poor: the median survival has been reported to be about 6 months with a mean of 11 months [17]. Radical surgical interventions seem to offer the best outcome; however, a complete surgical resection is often difficult to achieve [17]. Nevertheless, it seems that for patients who survived the initial surgery, the prospect for long-term survival is very promising [17]. A case report [17] referred a 8-year survival cardiac leiomyosarcoma managed by surgical and adjuvant chemotherapy. We hypothesize that long-term survival of the patients may be due to the confinement of lesion to the myocardial wall without pericardial involvement, the radical nature of the surgery with negative margins and the post-surgical adjuvant therapy (chemotherapy and radiotherapy).

It may be difficult to distinguish SS occurring in the digestive tract from other mesenchymal neoplasms; however, this distinction is crucial to ensure a correct therapeutic approach [18]. Immunohistochemistry plays an important and often efficient role in distinguishing synovial sarcomas from tumors that mimic them [11].

The primary differential diagnosis for monophasic SS of the small intestine are gastrointestinal stromal tumor (GIST) and leiomyosarcoma; in the ileum, the majority of malignant sarcomas are GI stromal tumors (GISTs) [3]. In the present case, the differential diagnosis between SS and leiomyosarcoma was especially important due to the previous history of primary atrial leiomyosarcoma of the patient. Commonly, a GIST may be differentiated from synovial sarcoma as c-KIT (CD117) is expressed in most GISTs [10]. Leiomyosarcomas are characterized by a high degree of pleomorphism and a panel of smooth muscle markers can usually confirm the diagnosis [11].

Fluorescence in situ hybridization (FISH) remains the gold standard and provides the most definitive diagnosis [10] because ability to conclusively establish the presence of the t(X;18) (p11; q11.2) chromosomal translocation, which leads to the formation of the SYT-SSX fusion gene, a sensitive and specific marker demonstrated in more than 90% of SS [10]. The resulting fusion SYT-SSX protein may act as a transcriptional regulator through interaction with other proteins to trigger synovial sarcoma development and proliferation [19].

The diagnosis of SS is becoming easier due to advanced techniques with FISH and immunohistochemical staining [15]. Therefore, the gastrointestinal SS have been reported only in the past few years, probably reflecting the fact that a wider application of immunohistochemistry and molecular techniques, as well as a growing awareness of the existence of visceral counterparts, has increasingly identified these unusually located tumors that might have been misdiagnosed in the past [11].

It is not clear the relationship between ileal SS and the previous atrial leiomyosarcoma; further studies are needed to elucidate this possible link.

We believe that any unusual presentation of SS should be reported to add to the relatively small pool of cases, in order to increase our knowledge and understanding of this neoplasm [3]. Indeed, also given the very low incidence, primary ileal SS is extremely rare and prone to misdiagnosis [11]. It is therefore important to be aware of the possibility of primary ileal SS [7]. Then we hope that a better definition of the biological nature and a more effective therapy of the tumor will be achieved by accumulation of the cases and advances in molecular pathology [7].

4. CONCLUSION

Primary ileal SS is extremely rare and often is misdiagnosed. Immunohistochemistry and molecular techniques play a key role in the diagnosis of SS arising in exceptional locations such as ileum. Radiological techniques, such as CT and MRI, are useful to identify the lesion, its size and complication (eg intussusception). Our report underlines the role of radiological features

in preoperative evaluation and the importance of considering this neoplasm in the differential diagnosis of any malignant spindle cell tumor of the gastrointestinal tract.

ETHICAL APPROVAL

The patient gave informed written consent for publication of this article and any accompanying images. Institutional review board approval was obtained.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Xu XQ, Hong T, Li BL, Liu W. Ileo-ileal intussusception caused by diffuse large B-cell lymphoma of the ileum. World J Gastroenterol. 2013;19(45):8449-52.
   DOI: 10.3748/wjg.v19.i45.8449.
2. Wiener-Carrillo I, González-Alvarado C, Cervantes-Valladolid M, Echaverry-Navarrete D, Zubieta-O'Farrill G, Gudiño-Chávez A. Intussusception secondary to a carcinoid tumor in an adult patient. Int J Surg Case Rep. 2014;5(5):265–267.
   DOI: 10.1016/j.ijscr.2014.01.022.
3. Alsharief AN, Fageeh M, Alabdulkarim Y. Monophasic synovial sarcoma presenting as a primary ileal mass: A case report and review of the literature. Journal of Medical Case Reports. 2012;6:83.
   Available:http://www.jmedicalcasereports.com/content/6/1/83
4. Tarkan Y, Erkan A, Selcuk ES, Mehmet K, Tugba KF, Ozlem US, Suleyman A, Tulay A, Bilge A, Ramazan Y, Yusuf G, Mevlude I, Umut D, Ilhan O, Abdurrahman I, Alper S, Dogan U, Necati A, Berna O, Gok DA, Ugur Y, Mahmut G. Clinical and pathological features of patients with resected synovial sarcoma: A multicenter retrospective analysis of the Anatolian Society of Medical Oncology. J Cancer Res Ther. 2014;10(1):73-8.
   DOI: 10.4103/0973-1482.131381.
5. Yaser S, Salah S, Al-Shatti M, Abu-Sheika A, Shehadeh A, Sultan I, Salem A, Sughayer M, Al-Loh S, Al-Mousa A. Prognostic factors that govern localized synovial sarcoma: A single institution retrospective study on 51 patients. Med Oncol. 2014;31:958.
   DOI: 10.1007/s12032-014-0958-8.
6. Travaglini G, Biagetti S, Alfonsi S, Bearzi I, Marmorale C. Primary intra-abdominal synovial sarcoma. A case report. Ann. Ital. Chir. (EP) 3 September; 2013.
   pii: S2239253X13021506.
7. Sahara S, Otsuki Y, Egawa Y, Shimizu S, Yoshizawa Y, Hosoda Y, Suzuki K, Sato Y, Kobayashi H. Primary synovial sarcoma of the stomach - A case report and review of the literature. Pathol Res Pract. 2013; 209(11):745-50.
   DOI: 10.1016/j.prp.2013.06.018.
8. Wang YJ, Wen SC, Chien ST, Sheu JW, Hsuea CW, Feng NH. Primary Intra-abdominal Synovial Sarcoma. J Chin Med Assoc. 2006;69(10):492-5.
9. Romeo S, Rossi S, Acosta Marín M, Canal F, Sbaraglia M, Laurino L, Mazzoleni G, Montesco MC, Valori L, Campo Dell'Orto M, Gianatti A, Lazar AJ, Dei Tos AP. Primary Synovial Sarcoma (SS) of the digestive system: A molecular and clinicopathological study of fifteen cases. Clin Sarcoma Res. 2015;5:7.
   DOI: 10.1186/s13569-015-0021-3.
10. Zhang HY, Feng Y, Zhang Z, Gao G, Zhao JS. Synovial sarcoma of the buttocks presenting with a non-healing wound and rapid progression after local resection: a case report. World Journal of Surgical Oncology. 2012;10:125.
11. Wang CC, Wu MC, Lin MT, Lee JC. Primary gastric synovial sarcoma. Journal of the Formosan Medical Association. 2012;111:516e520.
12. Jayaraman S, Devaji Rao S, Govindarajan M. Synovial sarcoma of anterior abdominal wall. Indian J Surg. 2010;72(Suppl 1): 293–295.
   DOI: 10.1007/s12262-010-0094-4.
13. Chokesuwattanaskul W, Terrell J, Jenkins LA. Monophasic Synovial Sarcoma Presenting as Mitral Valve Obstruction. Tex Heart Inst J. 2010;37(4):472-5.
14. Kanade US, Gadgil PA, Birare SD, Chaware SA, Kamra H. Abdominal Wall Synovial Sarcoma during Pregnancy - A Case Report. Indian J Surg. 2013; 75(Suppl 1):S463–S464.
   DOI: 10.1007/s12262-012-0794-z.
15. Eriksen C, Burns L, Bohlke A, Haque S, Slakey DP. Management of monophasic synovial sarcoma of the small intestine. JSLS. 2010;14(3):421-5.

DOI:10.4293/108680810X1292446600684 6.

16. Italiano A, Penel N, Robin YM, Bui B, Le Cesne A, Piperno-Neumann S, Tubiana-Hulin M, Bompas E, Chevreau C, Isambert N, Leyvraz S, du Chatelard PP, Thyss A, Coindre JM, Blay JY. Neo/adjuvant chemotherapy does not improve outcome in resected primary synovial sarcoma: A study of the French sarcoma group. Ann Oncol. 2009;20:425-30.
17. Glaoui M, Benbrahim Z, Belbaraka R, Naciri S, Errihani H, Lescene A. An uncommon long-term survival case of primary cardiac leiomyosarcoma. World Journal of Surgical Oncology. 2014; 12:338.
18. Romeo S, Rossi S, Acosta Marín M, Canal F, Sbaraglia M, Laurino L, Mazzoleni G, Montesco MC, Valori L, Campo Dell'Orto M, Gianatti A, Lazar AJ, Dei Tos AP. Primary Synovial Sarcoma (SS) of the digestive system: A molecular and clinicopathological study of fifteen cases. Clin Sarcoma Res. 2015;5:7.

    DOI: 10.1186/s13569-015-0021-3.
19. He R, Patel RM, Alkan S, Hammadeh R, Weiss SW, Goldblum JR, Venkataraman G, Baila H. Immunostaining for SYT protein discriminates synovial sarcoma from other soft tissue tumors: Analysis of 146 cases. Modern Pathology. 2007;20: 522–528.

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/11734