Tissue Microarray Based Immunohistochemical study of TLE1 in Synovial Sarcoma and its Histologic Mimics

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Abstract

Background: Synovial sarcoma is a translocation-associated mesenchymal neoplasm that represents around 10% of all soft tissue sarcomas. Diagnosing biphasic synovial sarcoma is generally straightforward, owing to distinctive histologic features. Transducer-like enhancer of split 1 (TLE1) is overexpressed in synovial sarcomas. Study aimed to evaluate sensitivity and specificity of TLE1 immunohistochemical expression in synovial sarcoma and its histologic mimics.

Methods: Conventional sections from 30 cases of synovial sarcoma, 24 cases of monophasic synovial sarcoma mimics and 6 cases of poorly differentiated sarcoma mimics were subjected to TLE1 IHC staining. TLE1 immunostaining was performed and graded from 0, 1+, 2+, 3+, with 2+ or 3+ grades interpreted as positive staining.

Results: Of the 60 tumours, majority are monophasic spindle cell type (56.6%), followed by biphasic (16.6%), monophasic epithelial (6.6%), poorly differentiated (13.3%) and calcifying type (5.3%)(6.6%). Upon expression of TLE1 in tumors, 20 cases showed Grade 3, 8 cases shown Grade 2, 2 cases shown Grade 1 TLE1 Expression in Synovial sarcoma, 2 cases shown Grade 2 and 2 cases shown Grade 2 TLE1 expression in Schwannoma. Whereas 1case shown grade 2 in Rhabdomyosarcoma. 1case shown grade 2 in Hemangioepicytoma. TLE1 sensitivity for diagnosis of synovial sarcomas was 93.3%, and specificity of 73.3% with positive predictive value of 77.77% and negative predictive value of 91.6%.

Conclusion: Specificity can be increased with optimal IHC panel which includes BCL2, Pan Cytokeratin, EMA, CD99 and CD34. Molecular confirmation is the diagnostic gold standard for synovial sarcoma, TLE1, in view of its high sensitivity may be a useful marker within the optimal IHC panel for substantiating a diagnosis of synovial sarcoma. Awareness of TLE1 expression in other tumours and its correct interpretation are necessary.

Keywords: Immunohistochemistry of synovial sarcoma, TLE1, Synovial sarcomas.

INTRODUCTION

Synovial sarcoma (SS) is a mesenchymaltumour, which displays a variable degree of epithelial differentiation including gland formation, and has a specific chromosomal translocation t(X; 18) (p11: q11) that leads to formation of a SS18-SSX fusion gene [1-4]. It is the fourth most common high grade soft tissue sarcoma, accounts for 5-10% of all soft tissue sarcomas and is accompanied by an often poor prognosis with high chance of metastasis despite surgical resection. Local control requires wide local excision and radiation therapy, causing significant morbidity in relatively young patients. Histologically, synovial sarcoma is subtyped into biphasic SS, monophasic SS, poorly differentiated SS and calcifying type [5]. The diagnosis of biphasic synovial sarcoma is generally straightforward, but the diagnosis of monophasic SS and poorly differentiated SS is challenging.

The diagnostic gold standard for synovial sarcoma is demonstration of the characteristic translocation between the SS18 (SYT) gene on chromosome 18 and one of three SSX genes (SSX1, SSX2, or rarely SSX4) on chromosome X (t(X;18)(p11.2;q11.2))(6,7). Detection of t(X;18) can be accomplished by cytogenetic karyotyping, fluorescence in situ hybridization (FISH) or reverse-transcriptasepolymerase chain reaction (RT-PCR), the use of these techniques is limited by many practical issues (cost, specialized equipment, availability). Thus, in practice the diagnosis of synovial sarcoma is usually

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Cytokeratin, EMA, CD99 and Bcl-2 are used to identify synovial sarcomas, but have limited specificity and sensitivity. Transducin-like enhancer of split 1 (TLE 1) gene is a member of the TLE gene family and involved in control of hematopoiesis, neuronal, and terminal epithelial differentiation [8-10]. TLE 1 competes with β-catenin, which plays an important role in Wnt/β-catenin signaling pathway [11, 12]. Several studies analyzed TLE1 as a diagnostic immunohistochemical marker for synovial sarcoma [13-17]. The study done by Kosemehmetoglu et al. concludes that TLE1 immunohistochemistry may play a limited role in diagnosis of SS with sensitivity of 85% and specificity of 75% [18]. In the present study, we will evaluate immunohistochemical expression of TLE1 in synovial sarcoma and its histological mimics.

Study designed to evaluate sensitivity and specificity of TLE1 immunohistochemical expression in synovial sarcoma and its histological mimics and to assess the value of TLE1 as a diagnostic marker in Synovial sarcoma.

**MATERIAL AND METHODS**

**Study design**

This is a prospective and retrospective study. Slides (H &E, special stains and IHC slides) and paraffin blocks were retrieved from surgical pathology archives of Department of Pathology at MNJIO & RCC. The study was approved by the institutional ethics committee. The study includes 30 cases of synovial sarcoma, 24 cases of monophasic synovial sarcoma mimics (2 Leiomyosarcoma, 4 Gastrointestinal stromal tumour, 2 Hemangiopericytoma, 3 Dermatofibrosarcomaprotuberans, 3 Fibrosarcoma, 3 MPNST, 2 Solitary fibrous tumour, 1 Malignant fibrous histiocytomaanda 4 Schwannoma) and 6 cases of poorly differentiated sarcoma mimics (4 Ewing sarcomas and 1 Rhabdomyosarcoma, 1 Desmplastic Small round cell tumor). The original H&E and IHC slides of all the cases were reviewed to confirm the diagnosis. The inclusion criteria for SS and its mimics included in the study are provided in Table 1.

**Table-1: Inclusion criteria of synovial sarcoma and its histological mimics**

| Cases                                | Criteria                                                                 |
|--------------------------------------|--------------------------------------------------------------------------|
| Synovial sarcoma (30)                | Classic morphology, peripheral location, Bcl2 positivity with panCK and CD99 and or EMA positivity |
| Leiomyosarcoma (2)                   | Classic morphology, with both Desmin and SMA positivity                  |
| Gastrointestinal stromal tumour (4)  | Classic morphology, with both CD117 and DOG1 positivity                  |
| Hemangiopericytoma (2)               | Classic morphology, CNS/PNS location and CD34 positivity                 |
| Dermatofibrosarcoma protuberance (3) | Classic morphology and location                                           |
| Fibrosarcoma (3)                     | Classic morphology                                                       |
| MPNST (3)                            | Classic morphology with background of Familial Neurofibromatosis          |
| Schwannomas (4)                      | Classic morphology and S-100 positivity                                   |
| Solitary fibrous tumour (2)          | Classic morphology and CD34+                                              |
| Ewing sarcoma (4)                    | Classic morphology, CD99 Positivity                                     |
| Rhabdomyosarcoma (1)                 | Classic morphology and myogenin positivity                               |
| Desmplastic small round cell tumor(1)| Classic morphology and location                                          |
| Malignant fibrous histiocytoma (1)   | Classic morphology and Vimentin positivity                               |

**Tissue microarray preparation**

The original H&E section of the tumor are reviewed, representative areas were identified and marked on the corresponding tissue blocks. Care was taken, to avoid the area with necrosis or and hemorrhage. The tissue cores were extracted from the marked area and transferred into corresponding tissue block. Marked tissues were extracted from the donor block using Quick-Ray needle with 5mm tip. One core was taken per case subject to availability of material. Tissue cores were delivered into corresponding holes of the recipient block and each core was numbered appropriately. Recipient block was put in embedding mold with cutting section faced down and incubated at 60°C for 30 minutes. Then, recipient block was embedded; sections were cut at 4μm thickness and taken on to charged slides for H&E and for IHC studies.

**Immunohistochemistry**

IHC analysis was carried out on TMA blocks using TLE1 (1F5) Mouse Monoclonal Antibody (CELL MARQUE, USA). Concentrated working solution was diluted in 1 in 30 dilutions.

**Immunohistochemistry technique**

The IHC was performed by semi-automated immunostainer (i6000, Biogenex). Immunohistochemistry (IHC) was done by Poly HRP technique. To fix, the sections were kept at 60°C for 30min.Dewaxing was done in 3 changes of xylene followed by hydration in graded alcohol and water. Antigen retrieval was done by using pressure cooker in TRIS EDTA at pH 9.0. After cooling to room temperature, sections were washed with three changes of distilled water to replace TRIS EDTA gradually. Then the slides were rinsed in phosphate buffer saline thrice for 5 minutes each followed by immersion in 3% methanol H2O2 for 10min to block endogenous
peroxidase activity and treated with power block for 10 minutes to inhibit binding to non-specific sites. Sections were incubated with primary antibody (TLE 1) for 90min, then secondary antibody (super enhancer) for 20min and HRP-polymer for 30min. In between each of these above steps two rinses of PBS for 5minutes each were applied. The antigen-antibody complex was visualized by using DAB (diaminobenzidine) as chromogen for 7min. Sections were counterstained with Harris’ hematoxylin for 1min. Then they were dehydrated through alcohol, cleared in xylene and mounted in DPX.

Positive control
Two cases showing SS18 break-apart by fluorescent in situ hybridization and showing positive staining with TLE 1 served as positive control.

Interpretation on IHC results
Nuclear immunoreactivity was graded as 0, 1+, 2+ and 3+ based on intensity and percentage of cells. More than 50% of the cells exhibit intense positivity which is visible with a 4X objective, was graded as 3+; 25-50% of the cells exhibiting intense positivity or more than 50% of the cells showing moderate intensity which is visible on 10X objective was graded as 2+; 5-25% of the cells with intense positivity graded as 1+; less than 5% staining of tumour nuclei is graded as nil (0).

STATISTICS
Over all Sensitivity, Specificity, Positive Predictive value and Negative Predictive value of TLE 1were calculated.

RESULTS
The study included a total of 60 cases; of which 30 are synovial sarcomas and 30 other benign and malignant mesenchymal tumors which can histologically mimic synovial sarcoma.

The complete demographic, clinical, histological characteristics and IHC results of synovial sarcoma included in the present study are summarized in Table 2, 3 and 4. The mean age of the patients is 30 years with male preponderance. Location wise majority are lower extremity tumors.

Of the included cases of SS, majority are monophasic spindle cell type (56.6%), followed by biphasic (16.6%), monophasic epithelial (6.6%), poorly differentiated (13.3%) and calcifying type (6.6%).

| Table-2: Demography, clinical profile and the tumour characteristics of patients with synovial sarcoma |
|-----------------------------------------------|
| Total patients (n) | 30 |
| Age in median (range) | 30 (13-68 years) |
| M:F | 1.7:1 |
| SIZE in median (range) | 6 (1cm to 30cm) |
| SITE |  |
| Lower extremities | 21 (70%) |
| Upper extremities | 5 (16.6%) |
| Aryepiglottic fold | 1 (3.3%) |
| Lung | 1 (3.3%) |
| Mediastinum | 1 (3.3%) |
| Urinary Bladder | 1(3.3%) |
| Type |  |
| Monophasic | 19 (63.3%) |
| Biphasic | 5 (16.6%) |
| Poorly differentiated | 4 (13.3%) |
| Calcifying type | 2(6.6%) |
| Recurrence | 5 patients |
| Metastasis | 1 patient (lung) |
| Unilateral inguinal lymphnodes(2) |
| Axillary lymphnode(1) |

| Table-3: Synovial sarcoma histological characteristics |
|-----------------------------------------------|
| Tumour patterns | Positive (n=30) | Percentage |
| Fascicles | 22 | 73.3% |
| Hemangiopericytomaticus | 15 | 50% |
| Hyalinization | 12 | 40% |
| Necrosis | 10 | 33.3% |
| Calcification | 10 | 33.3% |
| Myxoid changes | 6 | 20% |
| Cystic degeneration | 5 | 20% |
| Palisading | 5 | 16.6% |
| Herringbone | 3 | 10% |
| Ossification | 1 | 3.3% |
Table-4: Immunohistochemistry (IHC) results of patient with synovial sarcoma.

| IHC marker | Done (n) | No. of Positive cases | % Positivity |
|------------|----------|-----------------------|--------------|
| BCL2       | 30       | 30                    | 100%         |
| EMA        | 28       | 26                    | 92.8%        |
| CK         | 25       | 17                    | 68%          |
| S100       | 8        | 2                     | 25%          |
| CD99       | 25       | 21                    | 84%          |
| Vimentin   | 12       | 10                    | 83.3%        |
| DOG1       | 3        | -                     | 0%           |
| Desmin     | 3        | -                     | 0%           |
| CD34       | 5        | -                     | 0%           |
| Myogenin   | 1        | -                     | 0%           |

IHC results of TLE1 immunostaining on TMA slides are summarized in Table 5. Grade 3+ and 2+ staining was taken as positive. Accordingly TLE 1 positivity was observed in 28/30 (93.3%) cases of synovial sarcoma. The other tumours which showed positivity include 3/4 (75%) GIST cases, 1/2 (50%) Hemangiopericytoma, 4/4 (100%) Schwannomas, 1 Rhabdomyosarcoma (100%). All cases of leiomyosarcoma, Ewing sarcoma, Dermatofibrosarcomaprotuberans, Fibrosarcoma, MPNST, Malignant fibrous histiocytoma and Solitary fibrous tumor included in the study were negative for TLE 1. Accordingly TLE-1 showed a sensitivity of 93.3%, specificity of 73.3% with positive predictive value of 77.77% and negative predictive value of 91.6%.

Synovial sarcoma subtypes didn’t show much difference in TLE 1 immunostaining (Table 6). In case of biphasic tumor, TLE-1 positivity was noted in both epithelial and mesenchymal component. Intensity of TLE1 positivity was more in epithelial than mesenchymal component (Foo et al). Back ground staining is not observed in any of the tumor.

Fig-1: H&E 40X- Biphasic SS

Fig-2: H&E 40X Monophasic spindle SS
Table 5: Expression of TLE1 in tumors

| Total number of cases (n=60)       | TLE1 Expression |
|-----------------------------------|-----------------|
|                                   | Grade 0 | Grade 1 | Grade 2 | Grade 3 |
| Synovial sarcoma(n=30)            | 0       | 2       | 8       | 20      |
| Leiomyosarcoma(n=2)               | 2       | 0       | 0       | 0       |
| Gastrointestinal stromal tumour (n=4) | 0   | 1       | 2       | 1       |
| Ewing sarcoma (n=4)               | 4       | 0       | 0       | 0       |
| Hemangiopericytoma (n=2)          | 1       | 0       | 1       | 0       |
| DFSP (n=3)                        | 2       | 0       | 0       | 0       |
| Fibrosarcoma (n=3)                | 3       | 0       | 0       | 0       |
| MPNST (n=3)                       | 2       | 1       | 0       | 0       |
| Schwannoma (n=4)                  | 0       | 0       | 2       | 2       |
| Solitary fibrous tumour (n=2)      | 1       | 1       | 0       | 0       |
| Rhabdomyosarcoma (n=1)            | 0       | 0       | 1       | 0       |
| Desmoplastic small round cell tumor(1) | 1   | 0       | 0       | 0       |
| Malignant fibrous histiocytoma(1)  | 0       | 1       | 0       | 0       |

Table 6: TLE1 staining in synovial sarcoma subtypes

| Types of synovial sarcoma (n=30) | TLE1 Expression |
|-----------------------------------|-----------------|
|                                   | Grade 0 | Grade 1 | Grade 2 | Grade 3 |
| Monophasic SS(19)                 | 0       | 1       | 5       | 13      |
| Biphasic SS (5)                   | 0       | 1       | 1       | 3       |
| Poorly differentiated SS (4)      | 0       | 0       | 2       | 2       |
| Calcifying type of SS (2)         | 0       | 0       | 1       | 1       |

**DISCUSSION**

Synovial sarcoma has wide anatomic distribution and variable histologic patterns, which create diagnostic difficulties [5]. Monophasic fibrous synovial sarcoma can be difficult to distinguish from its histological mimics which include other spindle cell sarcomas such as Malignant peripheral nerve sheath tumours, Cellular Schwannomas, Solitary fibrous tumour, Fibrosarcoma, DFSP, Haemangiopericytoma, Malignant fibrous histiocytoma, GIST and Leiomyosarcoma. Mimics of poorly differentiated synovial sarcoma include Ewings sarcoma, Desmoplastic small round cell tumor and Rhabdomyosarcoma. Though IHC is helpful in differentiation, in many cases there may be overlapping immunohistochemical results. Molecular analysis is gold standard for diagnosis of synovial sarcoma, but use of these ancillary techniques is limited by many practical issues like cost and limited resources. Many attempts have been made to identify highly specific, sensitive marker for SS [19, 20]. Gene expression studies showed overexpression of TLE family genes, particularly TLE 1 in SS [21, 22].

Comparisons between our study and previous studies are summarized in Table 7. In the present study, sensitivity and specificity of TLE 1 for SS is 93.3% and 73.3% respectively which is similar to several other studies. The reported sensitivity in previous studies has ranged from 82-100% and specificity from 72-96%. Grading system for TLE1 positivity was similar to that followed by Terry et al, Jagdis et al. and Rekhi et al. Our sensitivity was similar to these three studies. The other two studies by Kosemehmetoglu et al. [18] and
Foo et al. [15] showed lesser sensitivity. However all these studies employed different grading scheme to assess TLE1 positivity. In the present study the number of cases with grade 3+ (19/30; 64%) positivity was higher than grade 2+ positive cases (9/30; 30%) which is similar to that reported by Terry et al. and Rekhi et al. [13, 17]. The remaining two TLE1 negative cases of SS in the present series was one MSS and one biphasic and both showed grade 1 staining. Though these 2 cases had classical morphology and IHC findings of SS, molecular confirmation was not done.

One of the limitations of present study compared to others was inclusion criteria for SS, which was mainly based on morphology and IHC findings, while others included molecularly confirmed cases. We tried to overcome this, by rigid morphological and IHC criteria. The correlation of our study results with that of other studies, further strengthens our inclusion criteria. The present study and that of Terry et al. [13] was carried out on tissue microarray, whereas the other studies used whole sections, however the results were well correlated. There was no significant difference in sensitivity for TLE1 among various histological types of SS included in present study, whereas Foo et al. observed higher sensitivity for PDSS (91%) when compared to overall sensitivity of SS (82%)[15].

The analysis of SS mimics showed a variation in the entities as well as number of cases included in different studies to analyze specificity of TLE 1. The positivity of MPNST to TLE 1 reported in previous studies ranges from 2.3-30%. In the present study all 3 were negative. Schwannomas have also shown wide range of positivity ranging from 0-100%. In our study, there was 100% (4/4) positivity. TLE1 on GIST was done in two studies-Kosemehmetoglu et al. [18] and Rekhi et al. [17] in 6 and 1 cases respectively and were negative whereas Terry et al. [13] studied 35 cases and showed positivity in 6% of their cases. !! We studied 4 cases of GIST, of which 3 were positive & 1 negative for TLE1 and all 4 were CD117 and DOG1 positive thereby concluding them as GIST rather than SS. There were 4 cases of Ewings sarcoma included in the present study which was TLE1 negative. Similar results were reported by many other studies as well, except for the study by Rekhi et al. [17], who demonstrated positivity in 40% of their cases. This could be due to different sensitivity of the antibody clone used. Of the 2 Haemangiopericytomas in the present study 1/2 cases (50%) had TLE1 positivity whereas Terry et al. [13] observed 40% positivity and is the only previous study to analyze TLE1 immunostaining in Haemangiopericytomas. The reported TLE1 positivity in leiomyosarcomas has been low ranging from 2-20%. In present study, all the 2 cases were negative. All cases of Dermatofibrosarcoma protuberance and Fibrosarcoma were negative for TLE 1 in the present study as were seen in other studies. Analysis of TLE1 on rhabdomyosarcoma was done in few previous studies. The reported TLE1 positivity in Rhabdomyosarcoma ranged from 0-100%. (Jagdis et al 0%, Rekhi et al. 100% [17], 100% Kosemehmetoglu et al. [18]. In our study the single case was in comparison with Kosemehmetoglu and Rekhi et al. TLE1 on desmoplasmic small round cell tumor was done in few previous studies. The reported TLE1 positivity in desmoplasmic small round cell tumor was 0%. (Rekhi et al. 0% [17], 0% in Kosemehmetoglu et al. [18]) including our study. Analysis of TLE 1 on malignant fibrous histiocyotma was negative in literature, similar to our single case.

We observed that most of the tumour(SS mimics) other than SS showed less intensity of positivity to TLE1. Chaung et al. also observed the same and concluded that, grading could differentiate SS from its mimics [23]. Negative predictive value of TLE 1 is 100% in study done by Jagdis et al. In the present study Negative Predictive Value is 91.6% which is close to the previous study whereas the Positive Predictive Value in this study is 77.7% which is much less when compared to jagdis et al. [14] (92%) study.

Microscopic pictures of TLE1 immunostaining
### Table-7: Comparison between present study and previous studies

| Variables | Terry et al. 2007 | Kosemehmetoglu et al. 2009 | Jagdis et al. 2009 | Foo et al. 2011 | Rokhi et al. 2012 | Present study, 2015 |
|-----------|------------------|------------------------|------------------|----------------|----------------|---------------------|
| Cases (SS+Mimics) | 693 (94+599) | 163 (20+143) | 108 (35+73) | 212 (73+139) | 112 (42+70) | 60 (30+30) |
| Inclusion criteria for SS | Molecularly Confirmed | MSS & PDSS – Molecularly proven | Molecularly proven | Molecularly proven | 21 cases – Morphology & IHC only | 30 cases – Morphology and IHC |
| – | – | – | – | – | 21 cases – Molecularly proven | 2 cases – M molecularly confirmed |
| Inclusion criteria of mimics | MPNST in background of NF | NM | NM | MPNST in background of NF and S-100 | Ewings sarcoma - molecularly proven | MPNST in background of NF and S-100 |
| Sections | TMA | Whole section | Whole section | Whole section | Whole section | TMA |
| Antibody | Polyclonal rabbit (M101) & Monoclonal anti-pan-TLE (Santa Cruz, USA) | TLE 1 (sc-9121) (Santa Cruz, USA) | Polyclonal rabbit (M101)(Santa Cruz, USA) | Polyclonal rabbit (M101)(Santa Cruz, USA) | Polyclonal rabbit (Abcam,USA) | Mouse monoclonal Antibody (Cell Marque, USA) |
| Criteria for grading | Percentage and intensity (0, 1+, 2+, 3+) | Percentage and intensity (0, 1+, 2+, 3+) | Intensity and percentage of cells evaluated separately | Percentage and intensity (0, 1+, 2+, 3+) | Percentage and intensity (0, 1+, 2+, 3+) |
| Sensitivity | 97% | 85% | 100% | 82% | 95.2% | 93.3% |
| Specificity | – | 75% | 96% | 92% | 72% | 73.3% |
| MSS | NM | NM | NM | 18/25 (72%) | NM | 18/19 (94.7%) |
| BSS | NM | NM | NM | 22/28 (78.6%) | NM | 4/5 (80%) |
| PDSS | 4/4 (100%) | NM | NM | 20/22 (90.9%) | NM | 4/4 (100%) |
| Calcifying type of SS | NM | NM | NM | NM | NM | 2/2 (100%) |
| MPNST | 4/88 (5%) | 3/10 (30%) | 1/43 (2.3%) | 7/47 (15%) | 2/12 (16.6%) | 0/3(0%) |
| Schwannomas | 5/16 (31%) | 9/11 (82%) | 0/1 (0%) | ND | 5/5 (100%) | 4/4 (100%) |
| SFT | 4/15 (27) | 1/5 (20%) | ND | 1/1 (100%) | 0/1 (0%) | 0/2 (0%) |
| Fibrosarcoma | 0/3 (0%) | 0/3 (0%) | 1/1 (100%) | ND | 0/1 (0%) | 0/3(0%) |
| Ewing sarcoma | 1/13 (8%) | 0/4 (0%) | 0/2 (0%) | 0/23 (0%) | 4/10 (40%) | 0/4(0%) |
| HPC | 2/5 (40%) | ND | ND | ND | ND | 1/2 (50%) |
| GIST | 2/35 (6%) | 0/6 (0%) | ND | ND | 0/1 (0%) | 3/4(75%) |
| RMS | ND | 3/39 (100%) | 0/1(0%) | ND | 2/2 (100%) | 1/1 (100%) |
| LMS | 1/41 (2%) | 1/5 (20%) | ND | ND | 1/5 (20%) | 0/2 (0%) |
| DFSP | 0/17 (0%) | ND | 0/5 (0%) | 0/20 (0%) | 0/1 (0%) | 0/3 (0%) |
| MFH | 0/56(0%) | ND | 0/1(0%) | ND | ND | 0/10(0%) |
| DSRCT | 0/4(0%) | 0/1(0%) | ND | ND | 0/1(0%) | 0/10(0%) |

**Abbreviations:** NM – Not mentioned; ND – Not done; MSS- monophasic synovial sarcoma; BSS- Biphasic synovial sarcoma; PDSS- poorly differentiated synovial sarcoma, MPNST- malignant peripheral nerve sheath tumour, SFT- solitary fibrous tumour, HPC- haemangioepithyoma, LMS- leiomyosarcoma, DFSP- dermatofibrosarcoma protuberance, RMS- rhabdomyosarcoma, MFH- malignant fibrous histiocytoma.

**CONCLUSION**

TLE 1 is a sensitive marker for synovial sarcoma. Specificity can be increased with optimal IHC panel which includes BCL2, Pan Cytokeratin, EMA, CD99 and CD34. Although molecular confirmation remains the gold standard, immunohistochemical studies for TLE1 along with other IHC markers are valuable in differential diagnosis, especially when access to molecular testing is limited. Awareness of TLE1 expression in other tumours, leading to its limited specificity, as well as its correct interpretation are necessary.

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