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Solitary Fibrous Tumor of the VaginaMimicking Leiomyoma: 1 ARare Case Report 2 3

ABSTRACT 4 Background:Solitary fibrous tumor (SFT) is an uncommon mesenchymal neoplasm, most 5 frequently arising from the pleura. Involvement of the female genital tract is rare, and 6 vaginallocalization is exceptionally uncommon, posing significant diagnostic challenges. 7 Case summary:A 20-year-old girl presented with dysuria, haematuria, lower back pain, 8 fever, and vaginal bleeding. Examination revealed a 6×8 cm firm, fixed, non-tender mass in 9 the right lateral vaginal wall. Imaging suggested a vascular heterogeneous mass consistent 10 with vaginal leiomyoma. She underwent complete surgical excision. Histopathology showed 11 a well-circumscribed spindle-cell tumor with hyalinized collagen, lymphocytic infiltration, 12 and characteristic staghorn vasculature, without mitosis or necrosis, confirming a solitary 13 fibrous tumor. The postoperative course was uneventful. 14 Conclusion:Vaginal SFT should be considered in the differential diagnosis of spindle-cell 15 vaginal tumors. Accurate diagnosis relies on characteristic histomorphology and confirmatory 16 immunohistochemistry, particularly STAT6. Complete surgical excision and long-term 17 follow-up are essential. 18 KEYWORDS: Solitary fibrous tumor; vagina; mesenchymal tumor; STAT6; spindle cell 19 tumor. 20

INTRODUCTION 21 Solitary fibrous tumor(SFT)is a rare fibroblastic mesenchymal neoplasmthat was originally 22 described in the pleuraand subsequently identified at a wide range of extra 23 pleurallocationsincluding the meninges,orbit,retroperitoneum, pelvis, and rarely,the 24 vagina.SFTs are extremely rare with an overall incidence of approximately 1-2 cases per 25 million individuals. In the female genital tract, SFT’s are infrequently encountered, and in 26 large series of genital SFT’s, only a single vaginal case was identified among 25 reported 27 tumors.To date, very few cases of primary vaginal SFT have been documented in the English 28 literature, highlighting its exceptional rarity. Most SFT’s are benign; however, approximately 29 10-20% demonstrate malignant potential.Clinically and radiologically, vaginal SFTmay 30 closely mimic leiomyoma, making preoperative diagnosis challenging. Clinical 31 manifestations depend on the anatomical site and may includedyspareunia, dysuria,bleeding 32 per vagina in women of reproductive

age. Diagnosis is primarily based on clinicalevaluation 33 and supported by imaging modalities such asthree-dimensional ultrasound or Magnetic 34 resonance imaging. Definitive diagnosis is established by Histopathological examination and 35 immunohistochemistry. 36 Surgical excision with complete removal of the tumor and negative margins is the 37 cornerstone of management for vaginal SFT. At present, there is no established role for 38

adjuvant radiotherapy or chemotherapy in histologically benign vaginal SFT's. Although 39 rare, SFT should be considered in the differential diagnosis of vaginal masses, frequently 40 misdiagnosed as leiomyoma, fibroma, or angiomyofibroblastoma preoperatively due 41 tosimilar presentation. Awareness of this rare tumor is important to ensure accurate diagnosis, 42 appropriate surgical management, and adequate follow-up. 43 44 CASE REPORT 45 A 20-year-oldadolescent girl, presented with complaints ofdysuriafortwo month and 46 haematuria for one week associated with lower back pain, fever and bleeding per vagina 47 forone week, she attained menarche at the age of 12 years and had regular menstrual cycles 48 with an average flow. There was no history of known comorbiditiesor chronic illness.She had 49 history of urinary tract infection eight-monthprior, for which she received treatment. Local 50 examination revealed a 6x8 cm firm, well-defined, smooth, non-tender, fixed massinvolving 51 the right lateral wall of the vagina, approximately 6 cm proximal to the introitus,no palpable 52 lymphadenopathy, per rectal examination revealed normal findings. Based on the clinical 53 examination findings a provisional diagnosis of vaginal leiomyoma was made. 54 Ultrasonography was suggestive of a heterogenous mass with internal vascularity, raising the 55 possibility of a cervical fibroid orvaginal leiomyoma. MRI findings revealed a large 56 heterogenous mass measuring approximately 6*6.6*8.4 cm, involving the right lateral wall of 57 the vagina and extending into the vaginal vault. Anteriorly the mass was compressing the 58 posterior aspect of the urinary bladder and displacing the urethra to the left. Fat planes were 59 maintained, supporting the diagnosis of vaginal leiomyoma. The patient underwent

complete 60 surgical excision of the mass. Intraoperative period was uneventful. Definitive diagnosis of 61 SFT was confirmed by histopathological examination which revealed a well-circumscribed 62 tumor composed of oval-to spindle cells and spindle-to-oval shaped nuclei. The cells were 63 arranged haphazardly in short fascicles with areas of hyalinised collagenous stroma and focal 64 streaming of cells. The tumorexhibited a prominent staghorn vasculature pattern. Areas of 65 lymphocytic infiltration were noted. Mitosis and necrosis were absent. Postoperative period 66 was uneventful. 67 68 69 Uterus solitary fibrous tumor

Figure1-MRI (T2 weighted image): Heterogenous iso to hyperintense bilobed lesion 70 involving right lateral vaginal wall – possibly suggestive of large vaginal leiomyoma 71 72 73 Figure 2- Intraoperative pictureFigure 3-Gross specimen: capsulated, bosselated mass 74 mass with areas of haemorrhage 75 76 DISCUSSION 77 SFT of the vagina is an exceptionally rare mesenchymal neoplasm, with only sporadic cases 78 reported in the literature. Owing to its rarity and nonspecific clinical presentation, vaginal 79 SFT is frequently misdiagnosed preoperatively as leiomyoma or other benign stromal tumors. 80 Most patients present with a slow-growing, painless vaginal mass, and imaging findings are 81 often inconclusive, underscoring the importance of histopathological and 82 immunohistochemical evaluation.Microscopically, SFT is characterized by a so-called 83 “pattern less pattern” of bland spindle cells embedded in a variably collagenous stroma with 84 prominent staghorn-shaped vessels. Immunohistochemistry plays a pivotal diagnostic role; 85 strong positivity for CD34, BCL-2, and especially nuclear STAT6 expression confirms the 86 diagnosis and distinguishes SFT from other vaginal spindle-cell lesions. In contrast, vaginal 87 leiomyomas show smooth muscle differentiation with desmin and smooth muscle actin 88 positivity and lack STAT6 expression. 89 Although the majority of vaginal SFTs follow a benign clinical course, malignant behaviour 90 has been reported in extra pleural sites, including the female genital tract. Features such as 91 increased cellularity, mitotic activity,

necrosis, and infiltrative margins may predict 92 aggressive behaviour. Therefore, complete surgical excision with clear margins remains the 93 treatment of choice, and long-term follow-up is advisable due to the potential for late 94 recurrence. 95 96 Feature Solitary Fibrous Tumor Vaginal Leiomyoma Origin Mesenchymal fibroblastic Smooth muscle

Gross Appearance Well circumscribed, firm Well circumscribed, whorled Histology Pattern lessspindle cells, staghorn appearance Interlacing smooth muscle bundles CD34/ STAT 6 positive negative SMA/DESMIN negative Strongly positive Recurrence Possible with incomplete excision rare Table 1: Difference between Solitary Fibrous Tumor and Vaginal leiomyoma 97 98 Each additional report of vaginal SFT contributes meaningfully to the limited evidence base, 99 helping refine diagnostic pathways, risk assessment, and follow-up strategies. Heightened 100 awareness among gynaecologists and pathologists will improve recognition of this rare tumor 101 and ultimately optimize patient outcomes. 102 CONCLUSION 103 From a gynaecological perspective, this case reinforces three key clinical messages. 104 First, rare mesenchymal tumors like SFT should remain in the differential diagnosis of 105 atypical or large vaginal masses, particularly when imaging features are not entirely 106 characteristic of leiomyoma. Differential diagnosis of vaginal masses includes vaginal 107 leiomyoma, cervical fibroid, gastrointestinal stromal tumor (GIST), schwannoma, Bartholin 108 cyst, aggressive angiomyxomas both clinically and radiologically. 109 Second, definitive diagnosis hinges on thorough histopathologic and immunohistochemical 110 evaluation, with STAT6 serving as a decisive marker. 111 Third, long-term surveillance is essential irrespective of apparently benign histology,but 112 malignant transformation possible in 10- 20%cases. Complete surgical excision with 113 negative margin is the classic treatment modality. Vaginal SFTs though rare, should be 114 followed up periodically every 6-12 months for first 2-3 years and then annually. 115 116 DECLARATIONS 117 Ethical approval and consent to participate- Not applicable. 118 Informed consent –Informed consent was obtained from the patient. 119 Conflict of

Interest-The authors declare that they have no competing interests. 120 Funding- None. 121

Acknowledgement-Not applicable. 122 123 124 REFERENCES 125 126 1.WHO Classification of Tumours Editorial Board. WHOclassification of tumours of 127 femalegenital tumours. 5th ed. Lyon: International Agency for Research on Cancer; 2020. 128 2. Rekhi B, Bapat P, Shetty O. A rare case of vaginal solitary fibrous tumor confirmed by 129 STAT6 and NAB2–STAT6 fusion. Int J Gynecol Pathol. 2019;38(5):453-58. 130 3. Demicco EG, Wagner MJ, Maki RG, Gupta V, Iofin I, Lazar AJ, et al. Risk assessment in 131 solitary fibrous tumors: validation and refinement of a risk stratification model. Mod Pathol. 132 2017;30(10):1433-42. 133 4. Robinson DR, Wu YM, Kalyana-Sundaram S, Cao X, Lonigro RJ, Sung YS, et al. 134 Identification of recurrent NAB2–STAT6 gene fusions in solitary fibrous tumor. Nat Genet. 135 2013;45(2):180-85. 136 5. Fritchie KJ, Jin L, Rubin BP, Burger CD, Jenkins SM, Yi ES. STAT6 137 immunohistochemistry is helpful in the diagnosis of solitary fibrous tumors. Am J 138 SurgPathol. 2013;37(7):1067-76. 139 6. Akiyama Y, Nabeshima K, Koita H, Yamanaka M, Koono M. Solitary fibrous tumor of 140 the vagina. Pathol Int. 2000;50(4):327-31. 141 7. Nascimento AG. Solitary fibrous tumor: anubiquitous neoplasm of mesenchymal 142 differentiation. Adv Anat Pathol. 1996;3(6):388-95. 143 144 145 146 147 148 149 150 151

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