

SURGICAL AND HISTOPATHOLOGICAL ANALYSIS OF SUBCUTANEOUS FIBROMA IN A PET RAT

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SUMMARY

Fibromas are benign tumors of fibrous connective tissue, seldom seen in pet rats. This case report details the diagnosis and surgical management of a fibroma in a 7-month old male Indian white pet rat. The rat presented with a rapidly growing, hard subcutaneous lump on the right abdomen. The tumor was excised under xylazine-ketamine anesthesia using electrocautery. Histological analysis showed a well-defined tumor with spindle-shaped fibroblasts and mature collagen fibers, devoid of aberrant cells or invasive growth. The absence of mitotic activity and cellular pleomorphism confirmed its benign nature. This case highlights the rare occurrence and successful surgical management of a subcutaneous fibroma in a rat.

Keywords: Fibroma, Histopathology, Indian white pet rat, Tumor

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Fibroma is a rare benign neoplasm composed of mature fibrous connective tissue which can be congenital, developmental or acquired in origin. Typically, the tumors are made up of interlacing bundles of uniform, fusiform spindle-shaped cells that produce varying amounts of collagen (Mohr, 1992). In rats, a fibroma of desmoid type (also known as fibromatosis-type) has been described as postoperative lesion in Bhd gene mutant rats (Kouchi *et al.*, 2008). This form of fibroma is occasionally seen in conventional strains as well. Fibromas have also been reported to develop in Wistar rats at the site of repeated injection of low doses of iron dextran solution (Roe and Carter, 1967). Fibromas are more commonly seen in larger animals and humans (Cullen *et al.*, 2002); however, their occurrence in rats offers valuable insights into the tumors pathology, treatment options and prognosis (Mumba *et al.*, 2013). In this study, we describe a case of fibroma with a distinctly fluctuating appearance, found in the subcutis near the right side of abdomen of an Indian white rat.

A 7-month old male Indian white pet rat was presented with a noticeable abdominal mass. The mass had been growing progressively over several weeks, leading to discomfort and reduced activity in the rat. Upon clinical examination, the mass was firm, irregular and fixed to the underlying tissues (Fig. 1A). Upon physical examination rat exhibited signs of discomfort and lethargy, with a palpable abdominal mass. On ventro-dorsal radiograph there was no evidence of metastasis. The mass was not attached to the abdomen (Fig. 1B).

The animal was anesthetized with a combination of inj. Xylazine (5 mg/kg body weight I/V, Xylaxin, Indian Pharmaceuticals Limited, Hyderabad, Telangana, India) and inj. Ketamine (50 mg/kg body weight I/V, AESKENT, Aespire Formulations Pvt. Ltd., New Delhi, India) administered intramuscularly with a ten-minute interval between injections (Amarpal *et al.*, 2010). The surgical excision of the tumor was performed using electrocautery

(Fig. 1C). Postoperatively, the animal received the antibiotic inj. Ceftriaxone (Intacef, Intas Pharmaceuticals Ltd., Ahmedabad, Gujarat, India) at a dose of 20 mg/kg body weight, administered intramuscularly for 5 days. An analgesic, inj. Meloxicam (Melonex, Intas Pharmaceuticals Limited, Gujarat, India), was given at a dose of 0.3 mg/kg body weight via the subcutaneous route for 3 days. Antiseptic dressing with a 1:10 dilution of povidone-iodine was applied on alternate days. The patient was closely monitored for any signs of complications and follow-up assessments were conducted regularly to evaluate the surgical site and ensure proper healing. Follow up assessment was done upto one month and proper healing or recovery of the rat was achieved during this period.

The histopathological findings revealed a dense, poorly cellular fibrous mass that compresses adjacent tissues with Haematoxyline and eosin (H & E) staining. It consisted of interwoven bands of mature collagen and interlacing bundles of well-differentiated fibroblasts. The fibroblasts were fusiform with elongated, tapered, hyperchromatic or vesicular nuclei and one or more nucleoli. Rare mitotic figures were observed; in some areas, pale blue myxomatous regions containing stellate cells were also present. The presence of well-differentiated fibroblasts and collagen bundles showed infiltration of surrounding musculature, but without cytological features indicative of malignancy.

A fibroma features a dense, sparsely cellular fibrous mass composed of well-differentiated fibroblasts that compresses surrounding tissue. It displays interwoven bands of mature collagen, scarce mitotic figures and minimal to no leukocyte infiltration (Greaves *et al.*, 2013). It can also originate from visceral organs, including the ovary, uterus, stomach and intestine (Sundberg and Nielsen, 1980). Cutaneous fibromas are common in dogs, while they are uncommon in other animals (Goldschmidt and Hendrick, 2002). The tumors aggressiveness necessitates prompt surgical intervention. Histological examination remains the

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Fig. 1. Tumorous growth attached on ventro-lateral abdominal wall (A), ventro-dorsal radiograph taken to rule out metastasis (B) and image taken post-surgery of the rat (C)

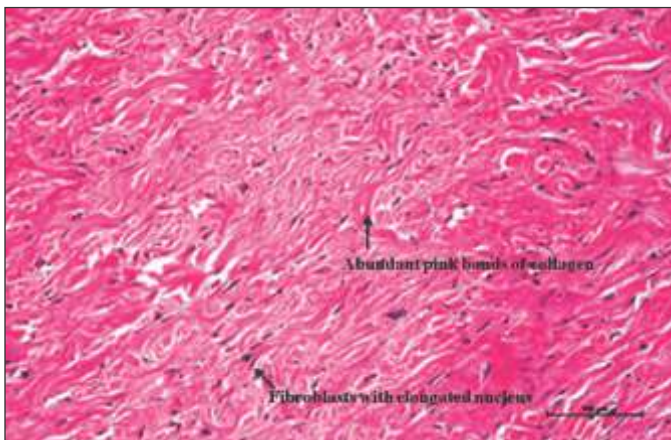


Fig. 2. Fibroma showed well differentiated fibroblasts with elongated nucleus, abundant pink bands of collagen in interwoven patterns. Overall, a poor cellular collagen rich fibroma is evident (H & E 40x).

gold standard for confirming the diagnosis and providing information on the tumors grade and potential behavior. In this case, the surgical approach was deemed effective and the tumor was removed with adequate margins. The histological findings are consistent with a fibroma due to the uniformity of cellular and nuclear appearance, absence of mitotic figures, organized growth pattern and previous descriptions of well-defined spindle-shaped cells and collagen fibers (Sastry and Rao, 2002). Blood vessels were congested, mitotic figures were absent and collagen was found in a bluish mucinous stroma, consistent with features of fibroma and fibromyxoma (Sastry and Rao, 2002). No recurrence or metastasis was reported for the three fibromas and two fibrosarcoma for which post-surgical clinical information was available (Parker and Picut, 1993).

CONCLUSION

Early detection, followed by prompt surgical intervention, is crucial for managing fibroma in pet rats. Histopathological

analysis remains essential for accurate diagnosis and prognosis of a case.

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