Veterinary Radiology & Ultrasound

WILEY

CASE STUDY OPEN ACCESS

CT Features of an Extraskeletal Osteosarcoma Associated With a Retained Surgical Sponge in a Dog

Kota Yamashita[1,2] | Misaki Osuga[1] | Shouta Nouchi[1] | Manabu Kurihara[3]

[1]Daktari Animal Hospital Tokyo Medical Center, Minato, Tokyo, Japan | [2]Kugayama Veterinary Medical Center, Suginami, Tokyo, Japan | [3]Molecular Biomedical Sciences, North Carolina State University, Raleigh, North Carolina, USA

Correspondence: Manabu Kurihara (mkuriha@ncsu.edu)

Received: 3 April 2025 | **Revised:** 19 March 2026 | **Accepted:** 9 April 2026

Keywords: computed tomography | extraskeletal osteosarcoma | gossypiboma | malignant transformation | surgical swab

ABSTRACT

An 8-year-old neutered female Labradoodle presented with acute restlessness and inability to stand. Point-of-care ultrasound revealed a large abdominal mass, prompting further imaging. Computed tomography (CT) demonstrated a mass with marked mineralization, a thick, enhancing rim, and signs of intra-abdominal dissemination. Surgical excision of the mass was performed, and histopathology confirmed extraskeletal osteosarcoma (ESOSA) secondary to a retained surgical sponge (gossypiboma). Four months post-surgery, the dog developed pulmonary metastases and was euthanized. This report is the first to describe CT findings of ESOSA secondary to a retained surgical sponge in a dog.

1 | Signalment, History, and Clinical Findings

An 8-year-old neutered female Labradoodle presented to Daktari Animal Hospital Tokyo Medical Center, with acute restlessness and collapse. The owner reported that the dog had been in good health until the morning of presentation. The dog had been spayed at 1 year by a referral veterinarian without additional surgeries.

On physical examination, the dog was alert but unable to stand. Mucous membranes were pale pink, with a capillary refill time of 1 s. Blood pressure was 113/76 mmHg (mean arterial pressure: 60 mmHg) using an oscillometric monitoring device. Point-of-care ultrasound (POCUS) revealed a large abdominal mass and a moderate amount of peritoneal effusion, with a packed cell volume of 4%. After administration of lactated Ringer's solution, approximately 800 mL of peritoneal effusion was drained under sedation. Ultrasound-guided fine-needle aspiration cytology was not performed.

2 | Imaging Diagnosis and Outcome

Upon presentation in shock, POCUS was performed, although radiographs were not obtained. Abdominal ultrasound identified a large, irregularly marginated mass occupying the abdominal cavity, with multiple surface protrusions. The cranial aspect of the mass displayed mixed hypoechoic and hyperechoic areas with partial acoustic shadowing, whereas the caudal aspect had a hyperechoic rim and a predominantly hypoechoic center. Continuity with adjacent organs was not observed; however, vascular structures appeared to be contiguous with the mass.

Computed tomography (CT) of the thorax and abdomen was performed using a 16-slice scanner (Brivo CT385, GE Healthcare Japan, Tokyo, Japan). Post-contrast images were acquired during arterial and venous phases following intravenous injection of iohexol (600 mg/kg; Omnipaque 300, GE Healthcare Pharma, Tokyo, Japan) via the cephalic vein with a power injector (Smart Shot, Nemoto Kyorindo Co., Ltd., Tokyo, Japan); the injection

Abbreviations: CT, computed tomography; ESOSA, extraskeletal osteosarcoma; POCUS, point-of-care ultrasound.

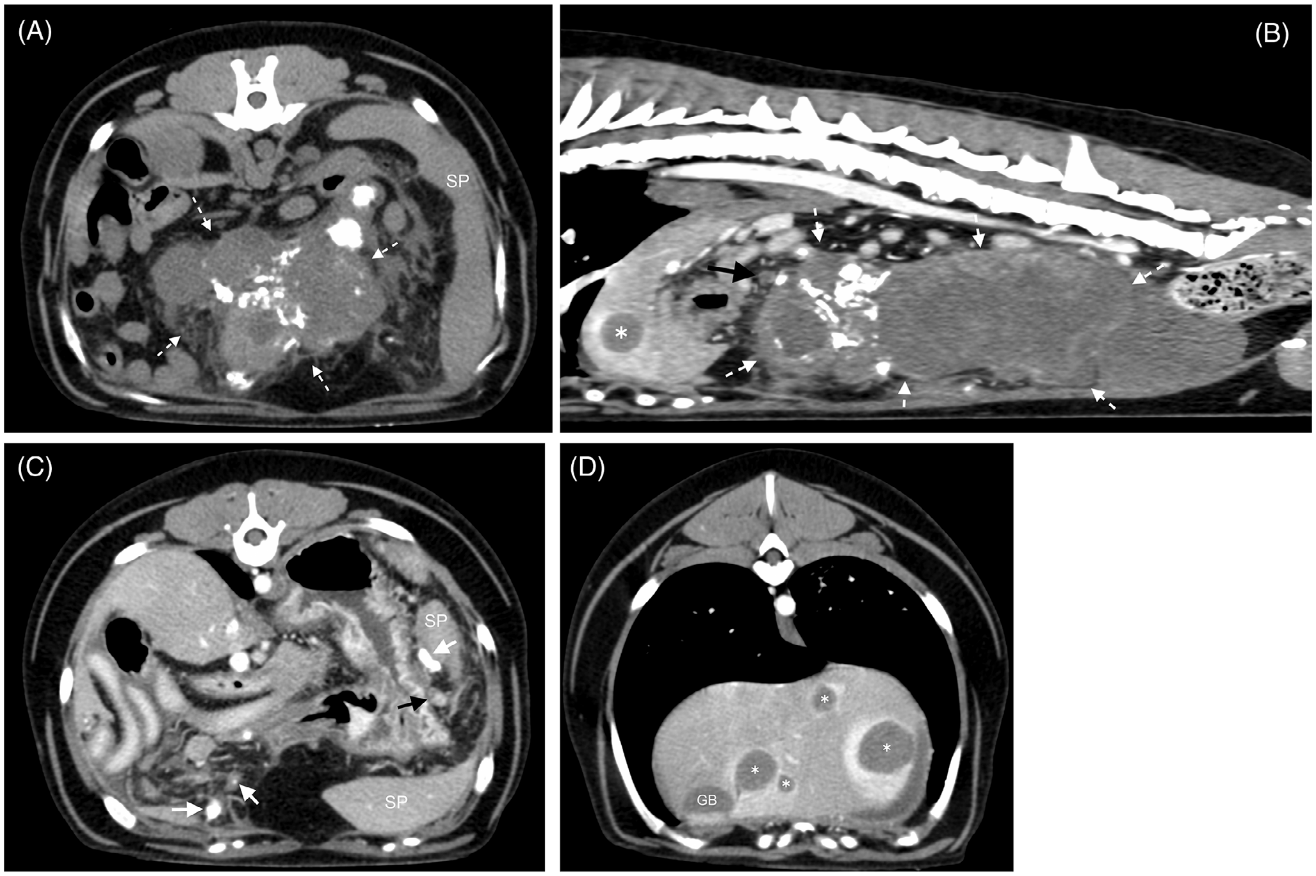

FIGURE 1 | Pre-contrast transverse (A), portal phase mid-sagittal (B), and post-contrast transverse (C and D) CT images of the abdomen in a soft-tissue algorithm. (A and B) A large, irregularly marginated, soft-tissue-attenuating mass with an irregular rim enhancement pattern and a non-enhancing center is identified within the abdominal cavity, extending from the level of the stomach to the urinary bladder (white dashed arrows). The cranial portion of the mass appears multi-lobulated with areas of multifocal mineralization. (B and C) Multiple irregularly marginated, contrast-enhancing soft-tissue nodules are noted in the mesentery near the cranial multi-lobulated portion of the mass, including mineralized (white arrows) and non-mineralized (black arrow) nodules. (B and D) Hypoattenuating hepatic masses show well-defined, strong rim contrast enhancement (white asterisks). GB, gallbladder; SP, spleen.

was administered at a dose of 2 mL/kg over 17 s. Post-contrast images were acquired during portal (40 s post-injection) and venous (120 s post-injection) phases. Imaging parameters were 120 kVp and 100 mA with a 1.0 s rotation time, helical mode with a pitch of 1.75, 1.25 mm slice thickness with a 0.625 mm reconstruction interval, reconstructed field of view 323 mm, and a 512 × 512 matrix. Images were reconstructed with soft tissue and lung algorithms, reformatted in transverse, dorsal, and sagittal planes, and reviewed using soft-tissue windows (WW, 350 HU; WL, 40 HU) and lung windows (WW, 1500; WL, −600), with manual adjustments as needed.

A very large, irregularly marginated soft-tissue attenuating mass (21.0 cm length × 10.3 cm height × 12.6 cm width) was identified within the mid-aspect of the abdominal cavity, extending from the stomach to the urinary bladder (Figure 1A,B). The cranial portion of the mass appeared multi-lobulated, suggesting a coalescing cluster of multiple masses (Figure 1A). The caudal portion of the mass showed several protrusions from its margins. Multifocal mineral attenuating foci were scattered, primarily in the central distribution of the cranial multi-lobulated mass. The mass exhibited an irregular rim contrast enhancement with gradual enhancement from the portal to venous phases (30 HU precontrast; 60 HU portal; 90 HU venous). The center of the mass showed poor contrast enhancement (20 HU), compatible with necrosis. A small amount of peritoneal effusion was present adjacent to the mass. Although the mass was supplied by branches of the left and right gastroepiploic arteries, the mass origin was not identified. Multiple irregular nodules (up to 1.3 cm) similar to the mass were noted in the peritoneal cavity adjacent to the cranial portion of the mass, predominantly mineral attenuation (Figure 1C). At least seven hypoattenuating masses (up to 2.1 cm) were observed in the left lateral and left medial hepatic lobes with strong rim contrast enhancement with gradual central contrast enhancement from the portal to venous phases (Figure 1B,D; rim: 60 HU precontrast, 150 HU portal, 130 HU venous; center: 35 HU precontrast, 45 HU portal, 50 HU venous). No pulmonary or lymphatic metastases were detected. The differential diagnosis for a mineralized abdominal mass of unknown origin includes extraskeletal bone tumors (osteosarcoma or chondrosarcoma), mineralized granuloma, and mineralized cyst.

On Day 3, at the owner's request, a laparotomy was performed. Anesthesia was induced with propofol (6 mg/kg) and midazolam (0.2 mg/kg), then maintained with isoflurane, following standard protocol. Antibiotic prophylaxis (ABPC-CVA, 30 mg/kg) and

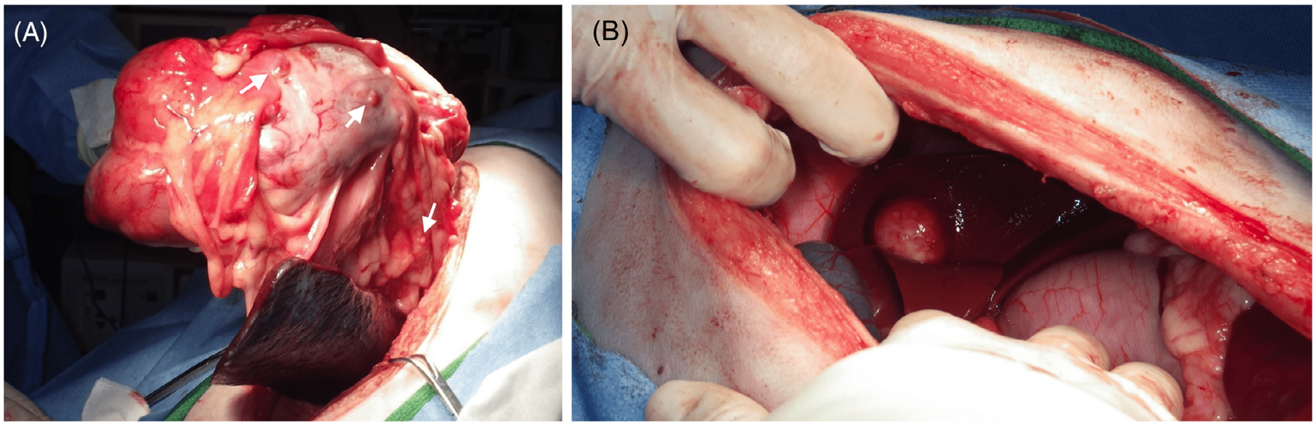

FIGURE 2 | Gross findings of the abdominal mass during surgery. The mass displays an irregular surface, resembling multiple fused masses. It is isolated, without continuity to adjacent organs; however, adhesions to the omentum and splenic artery are noted. (A) Small mesenteric nodules are visible (white arrows). (B) A hepatic nodule is visible, consistent with metastasis.

analgesia (fentanyl, 4 mcg/kg/h) were administered, whereas dopamine and dobutamine infusions were used to maintain blood pressure. A large mass adhered to the omentum, with multiple nodules on the omentum and mesentery indicating peritoneal metastasis; the mass was retracted, and the omentum was transected at the adhesion site (Figure 2A). The spleen was removed en bloc with the mass due to adherence of the splenic artery and vein. No adhesions to other abdominal organs were noted. Macroscopic examination revealed yellowish-white nodules on the liver surface. A liver nodule (Figure 2B) and several omental nodules were excised for histopathology. Intraoperative blood loss was minimal, and the abdomen was closed without requiring transfusion.

Histopathological examination of the abdominal mass, hepatic nodule, and omental nodules exhibited neoplastic proliferation of mesenchymal cells (Figure 3A). These masses demonstrated abundant production of immature bone and osteoid, consistent with a diagnosis of extraskeletal osteosarcoma (ESOSA; Figure 3B). Evidence of metastasis to the liver and mesentery was observed. The abdominal mass showed extensive necrosis, with the presence of fibrous, nonbiological material, suspected to be consistent with gauze, surrounded by degenerated collagen fibers and necrotic bone fragments (Figure 3C,D).

Postoperatively, the patient received ampicillin–clavulanic acid (30 mg/kg IV), maropitant (1 mg/kg IV), and fentanyl (4 mcg/kg/h CRI) for 48 h. Two months postoperatively, the patient returned with inappetence, and thoracic radiographs revealed multiple variably sized soft-tissue opaque nodules, consistent with pulmonary metastasis not previously detected. About 1 month later, the condition deteriorated, and the owner elected euthanasia.

3 | Discussion

A retained surgical sponge in the abdominal cavity was identified as the site of ESOSA, confirmed by CT imaging and histopathology. This is the first report detailing CT features of ESOSA associated with a surgical sponge in veterinary medicine. ESOSA is a rare malignant mesenchymal tumor that arises in soft tissues and is characterized by the production of osteoid without a primary bone origin [1–3]. In humans, ESOSA is exceedingly rare, comprising approximately 1.2% of soft-tissue sarcomas and 3.7%–4.6% of osteosarcomas [4, 5]. The incidence of ESOSA in dogs remains uncertain; however, some studies indicate that it may account for up to 11% of canine osteosarcoma cases [1, 2]. Unlike in humans, where ESOSA frequently develops in soft tissues or limbs [5], in dogs, this tumor more commonly originates within internal organs and demonstrates extensive infiltration into surrounding tissues [2–4]. The reason for this species-specific difference remains unclear, as the exact etiology of ESOSA has not yet been fully elucidated. In humans, ESOSA has been associated with prior trauma or radiation therapy, and reports indicate a relatively higher incidence of tumors originating from muscle tissue [1, 5]. These findings suggest that factors such as muscle mass, its distribution, or the risk of organ injury may contribute to this disparity, although further research is required to establish any definitive correlations. Hematogenous metastasis is frequently observed in ESOSA, similar to conventional osteosarcoma cases [6], with most cases in both humans and dogs exhibiting metastatic spread or recurrence. This characteristic significantly contributes to the poor prognosis associated with ESOSA [5].

Gossypiboma, also known as textiloma, is a non-neoplastic iatrogenic lesion resulting from a retained surgical sponge, leading to a foreign body reaction often associated with granuloma formation. In humans, retained surgical materials are reported in approximately 1 in 8801–18,760 surgeries, with an incidence of 1 in 1000–1500 for abdominal surgeries [7, 8]. Although gossypiboma is acknowledged in veterinary medicine, reported cases are rare, likely due to its association with medical negligence [9–12]. However, its true incidence may be comparable to, or even exceed, that observed in human medicine [12, 13]. Retained surgical sponges in veterinary practice often present with mild or no symptoms, making early detection difficult. These retained surgical sponges can remain lodged within the mesentery without direct association with abdominal organs for years after the initial surgery [10, 12, 14] or may migrate and be expelled into a hollow organ, such as the intestine [15, 16]. Clinical signs, when present, are nonspecific and depend on the location of the sponge

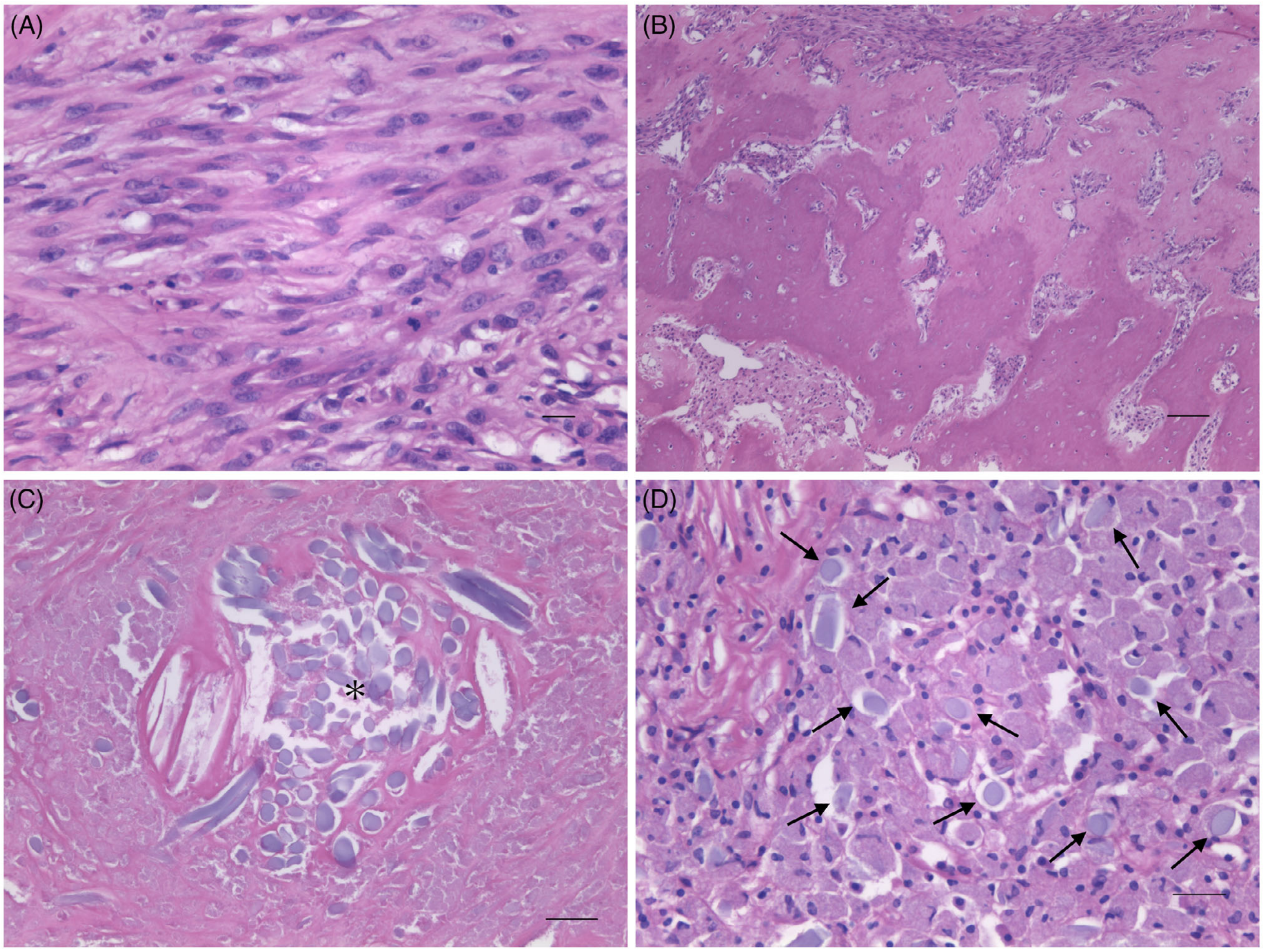

FIGURE 3 | Histopathological images of the abdominal mass (H&E). (A) Histopathologic examination shows a tumor consisting of non-epithelial cells with marked cellular atypia and a relatively high mitotic rate. The tumor cells, which are spindle-shaped or pleomorphic, proliferate in a streaming or interwoven pattern. 200×. Bar = 20 µm. (B) Tumor cells are observed producing abundant immature bone as they proliferate. 40×. Bar = 100 µm. (C) Abundant fibrous structures consistent with gauze (black asterisk) are present within the abdominal mass. 100×. Bar = 50 µm. (D) Surrounding the fibrous structures engulfing the gauze are degenerated collagen fibers (black arrows) and necrotic bone. 200×. Bar = 20 µm.

and the nature of the associated inflammatory response [10, 15]. Inflammatory responses to foreign bodies are generally classified into two types: fibrous and exudative [15, 17]. A fibrous response is a chronic reaction that leads to the formation of aseptic granulomas, organ adhesions, and encapsulation of the foreign material, often progressing slowly and potentially remaining dormant for years. In contrast, an exudative response is acute, leading to abscess or fistula formation and potentially sepsis if infection occurs, with clinical symptoms appearing more rapidly. In rare cases, chronic inflammation caused by a retained surgical sponge can lead to malignancy [14, 18–23]. This case highlights how such chronic inflammatory stimuli can trigger the formation of a rare, aggressive tumor within the abdominal cavity. In humans, there are several reports of angiosarcoma developing in association with gossypiboma [24–28]. In veterinary medicine, 5 cases of ESOSA associated with gossypiboma have been reported in dogs [14, 18–23]. These tumors tend to be highly invasive and frequently present with metastasis or extensive infiltration at diagnosis, contributing to a poor prognosis. The survival outcomes for gossypiboma-associated ESOSA in dogs, reported in the previous literatures as 2–3 months, appear to be comparable to, or worse than, those of primary ESOSA, with generally shorter survival times compared to skeletal osteosarcoma [3, 14, 19, 20]. In this case, the patient presented with a rapid onset of lethargy, abdominal distension, and anemia, despite previously being asymptomatic, as reported by the owner. This acute onset made early detection challenging for the owner and primary veterinarian during routine evaluations. The rapid development of clinical signs was likely attributable to the malignant transformation of aseptic granulomas originating from a chronic fibrous inflammatory response that had remained dormant for years. The tumor expanded rapidly, causing circulatory disturbances and ascites. Within approximately 2 months of the initial identification of the abdominal mass, the patient exhibited rapid progression of metastatic lesions in the lungs and other areas, as confirmed by radiographic and ultrasonographic evaluations. The extensive metastatic disease undoubtedly played a critical role in the patient's clinical decline.

Although radiographs were not obtained in this instance, typical radiographic indicators of retained surgical sponges in dogs include mottled or swirling gas patterns [10, 12]. Although mineralization may be present in cases of ESOSA, it is not considered a definitive feature [4, 5]. Abdominal ultrasound revealed a large mass with multiple protrusions on its surface. The ultrasound characteristics of the mass varied by region. The cranial aspect displayed solid mass with mixed hypoechoic and hyperechoic areas, accompanied by partial mineralization. The caudal aspect was encircled by a hyperechoic area with a predominantly hypoechoic center, suggestive of necrosis, abscess, or hemorrhage. These findings are consistent with previous descriptions of ESOSA [20]. The large size and varying ultrasound characteristics of the mass pose challenges in differentiating ESOSA from other masses or granulomas.

CT is essential for assessing tumor size, shape, invasion, and metastasis, thereby improving diagnostic accuracy, guiding treatment planning, and aiding in prognosis. This is especially critical for highly invasive tumors like ESOSA, where CT is invaluable for evaluating soft-tissue involvement and confirming the absence of invasion, an important diagnostic feature. The CT characteristics of gossypiboma have been reported in veterinary literature [9, 15, 29–32]; however, detailed descriptions of its typical imaging appearance remain limited. Gossypiboma is typically characterized by a thick, enhancing rim and a lack of continuity with surrounding organs. Internally, it often displays a speckled or sponge-like gas pattern [9, 15, 32], as noted in both human and veterinary cases. Mineralized areas may also be present, and radiopaque markers can facilitate the identification of retained surgical sponges on imaging if such markers are used [15, 29]. Specific CT characteristics of ESOSA remain undocumented, with previous reports limited to radiographic and ultrasound findings. This case highlights the malignant transformation of a retained surgical sponge into an ESOSA, driven by chronic inflammatory reactions, and provides distinct CT features compared to typical gossypiboma cases. The tumor was notably large, extending from the stomach to the bladder, and exhibited significant mineralization, which varied across regions but was more pronounced than the mineralization usually observed in gossypiboma [9]. The aggressive nature of ESOSA led to the development of metastatic lesions in the liver and peritoneum, with the primary mass showing irregular morphology and multiple projections. Despite these malignant features, some imaging characteristics, such as a thick, enhancing rim and a lack of continuity with adjacent organs, were consistent with gossypiboma [9, 31]. In addition to gossypiboma, the differential diagnosis for a mineralized abdominal mass includes nodular fat necrosis [33], ovarian teratoma [34], chondrolipoma [35], cecal mucocele [36, 37], calcifying fibrous tumor of the gastrointestinal tract [38], and calcified simple mesenteric cyst [39]. Although not described in veterinary medicine and to be considered according to anatomical particularities, calcified autoamputated appendix [40], calcified appendiceal mucinous cystadenoma [41], could be added to the differential diagnosis list. In the present case, the large size of the mass, the extent and pattern of mineralization, the lack of continuity with adjacent organs, and hepatic and peritoneal metastases collectively favored a diagnosis of ESOSA over these entities. It is crucial to note that in advanced tumor stages, features like these may be obscured by complications, including rupture or adhesion. This report provides the first detailed description of CT findings for ESOSA secondary to gossypiboma in veterinary medicine.

After recovering from shock, the patient's condition improved significantly, prompting an assessment that tumor resection might help maintain quality of life. However, the extensive peritoneal dissemination of the mass rendered curative treatment impractical, leading to a decision to focus on palliative care rather than chemotherapy. This approach allowed the patient to maintain daily activities for over 3 months. The survival period of 108 days was comparable to or slightly longer than the 2–3 months reported in previous literature [14, 19, 20]. The primary cause of the clinical symptoms was a single large tumor, and the metastatic lesions did not progress to the extent of causing organ dysfunction. This may have contributed to the prolonged survival period following tumor resection. In human medicine, limited data are available on chemotherapy for ESOSA [42, 43], although some studies suggest that protocols for soft-tissue sarcomas, such as those combining anthracycline-based agents with platinum compounds, may improve survival outcomes [43]. However, such protocols have not been extensively explored in veterinary cases of ESOSA. Reports in veterinary literature indicate that the prognosis for ESOSA remains poor, with survival outcomes often grim despite surgical intervention or chemotherapy [2, 4, 11, 14, 19]. Extended survival has occasionally been reported following surgical resection and chemotherapy; however, the prognosis remains guarded even in these cases, and the probability of achieving a cure remains very low [4, 5, 20].

To prevent the development of highly malignant tumors associated with gossypiboma, stringent measures to avoid retained surgical sponges are essential. A standardized approach for counting surgical sponges before and after procedures, supplemented by a double-check system involving both veterinarians and support staff, is crucial to minimize errors. Studies indicate that surgical gauze counting has a sensitivity of 77.2% and a specificity of 99.2% [8]. In cases where discrepancies in sponge counts arise, a thorough search of the surgical field and operating room should be conducted to locate any missing items before concluding the procedure. Using radiopaque gauze is strongly recommended to aid in identifying retained material during imaging. Additionally, all surgical waste should be labeled and securely stored until all counts are verified, ensuring traceability throughout the process.

In veterinary medicine, deviations from standard surgical protocols are common, and the limited availability of trained scrub nurses may increase the risk of gossypiboma in animals compared to humans [12]. The likelihood of retained surgical sponges is particularly elevated in scenarios such as emergency surgeries, modifications to planned procedures, and cases involving obese patients [7]. Consequently, increased vigilance is essential in these situations.

4 | Conclusion

In summary, this case report provides the first documentation of CT findings associated with ESOSA resulting from retained surgical sponges in the abdominal cavity of a dog. ESOSA is a highly malignant tumor characterized by aggressive infiltration and the formation of metastatic lesions, making curative treatment extremely challenging. Although this case report aims to support the early detection and management of such severe complications, it is important to note that gossypiboma is suspected but not identified through imaging diagnostics. Therefore, implementing preventive strategies to reduce the risk of retained surgical sponges is essential.

Author Contributions

Kota Yamashita: conceptualization, data curation, visualization, project administration, writing – original draft, investigation. **Misaki Osuga**: data curation, investigation, resources. **Shouta Nouchi**: resources. **Manabu Kurihara**: conceptualization, methodology, validation, supervision, visualization, project administration, writing – review and editing.

Acknowledgments

We would like to express our sincere gratitude to the patient and owner. We also extend our thanks to Dr. Gen Kato, Dr. Toshiro Sako and Dr. Midori Goto Asakawa.

Disclosure

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

For data associated with this study, please contact the corresponding author.

References

1. A. K. Kattepur, A. Gulia, R. L. Jones, and S. Rastogi, "Extraskeletal Osteosarcomas: Current Update," *Future Oncology* 17, no. 7 (2021): 825–835.

2. A. Langenbach, M. Anderson, D. Dambach, K. Sorenmo, and F. Shofer, "Extraskeletal Osteosarcomas in Dogs: A Retrospective Study of 169 Cases (1986–1996)," *Journal of the American Animal Hospital Association* 34, no. 2 (1998): 113–120.

3. A. K. Patnaik, "Canine Extraskeletal Osteosarcoma and Chondrosarcoma: A Clinicopathologic Study of 14 Cases," *Veterinary Pathology* 27, no. 1 (1990): 46–55.

4. C. Kuntz, W. Dernell, B. Powers, and S. Withrow, "Extraskeletal Osteosarcomas in Dogs: 14 Cases," *Journal of the American Animal Hospital Association* 34, no. 1 (1998): 26–30.

5. G. McAuley, J. Jagannathan, K. O'Regan, K. M. Krajewski, J. L. Hornick, J. Butrynski, and N. Ramaiya, "Extraskeletal Osteosarcoma: Spectrum of Imaging Findings," *American Journal of Roentgenology* 198, no. 1 (2012): W31–W37.

6. S. J. Withrow and D. M. Vail, eds., *Withrow and MacEwen's. Small Animal Clinical Oncology*, 4th ed. (Saunders Co, 2007).

7. A. A. Gawande, D. M. Studdert, E. J. Orav, T. A. Brennan, and M. J. Zinner, "Risk Factors for Retained Instruments and Sponges After Surgery," *New England Journal of Medicine* 348, no. 3 (2003): 229–235.

8. N. N. Egorova, A. Moskowitz, and A. Gelijns, "Managing the Prevention of Retained Surgical Instruments," *Annals of Surgery* 247, no. 1 (2008): 13–18.

9. M. Auger, S. Olin, and F. Morandi, "Novel CT Features of an Abdominal Gossypiboma in a Female Dog," *Case Reports in Veterinary Medicine* 2019 (2019): 1–6.

10. K. Forster, D. Anderson, D. A. Yool, C. Wright, and R. Burrow, "Retained Surgical Swabs in 13 Dogs," *Veterinary Record* 169, no. 13 (2011): 337–337.

11. W. Mai, D. Ledieu, L. Venturini, et al., "Ultrasonographic Appearance of Intra-Abdominal Granuloma Secondary to Retained Surgical Sponge," *Veterinary Radiology & Ultrasound* 42, no. 2 (2001): 157–160.

12. M. Merlo and C. R. Lamb, "Radiographic and Ultrasonographic Features of Retained Surgical Sponge in Eight Dogs," *Veterinary Radiology & Ultrasound* 41, no. 3 (2000): 279–283.

13. J. D. Frank and B. J. Stanley, "Enterocutaneous Fistula in a Dog Secondary to an Intraperitoneal Gauze Foreign Body," *Journal of the American Animal Hospital Association* 45, no. 2 (2009): 84–88.

14. M. A. Miller, R. L. Aper, A. Fauber, W. E. Blevins, and J. A. Ramos-Vara, "Extraskeletal Osteosarcoma Associated With Retained Surgical Sponge in a Dog," *Journal of Veterinary Diagnostic Investigation* 18, no. 2 (2006): 224–228.

15. A. Anson, J. D. Carrillo, A. Bayon, M. T. Escobar, J. Seva, and A. Agut, "Imaging Diagnosis—Computed Tomography Findings in a Dog With Spontaneous Transmural Migration of a Textiloma Into the Cecum," *Veterinary Radiology & Ultrasound* 59, no. 3 (2018): E28–E31.

16. J. L. Day, R. D. Pechman, and R. J. Bahr, "Migration of a Retained Surgical Swab Into the Jejunum in a Dog," *Journal of Small Animal Practice* 53, no. 12 (2012): 705–708.

17. V. C. Gibbs, F. D. Coakley, and H. D. Reines, "Preventable Errors in the Operating Room: Retained Foreign Bodies After Surgery—Part I," *Current Problems in Surgery* 44, no. 5 (2007): 281–337.

18. M. Goto, K. Owaki, A. Hirata, M. Murakami, and H. Sakai, "Extraskeletal Osteosarcoma Associated With Two Different Types of Synthetic Fibers Derived From a Surgical Swab in a Dog," *Journal of Veterinary Medical Science* 84, no. 8 (2022): 1056–1060.

19. A. D. Pardo, W. H. Adams, M. D. McCracken, and A. M. Legendre, "Primary Jejunal Osteosarcoma Associated With a Surgical Sponge in a Dog," *Journal of the American Veterinary Medical Association* 196, no. 6 (1990): 935–938.

20. J. E. Slovak, N. R. Kieves, and J. Haynes, "Extraskeletal Osteosarcoma Induced by a Foreign Body Granuloma," *Journal of the American Animal Hospital Association* 51, no. 5 (2015): 315–319.

21. W. A. Bradley, "Extraskeletal Soft Tissue Compound Osteosarcoma Intimately Associated With a Retained Surgical Sponge," *Australian Veterinary Practitioner* 25 (1995): 172–175.

22. E. L. Rayner, C. L. Scudamore, I. Francis, and S. Schöniger, "Abdominal Fibrosarcoma Associated With a Retained Surgical Swab in a Dog," *Journal of Comparative Pathology* 143, no. 1 (2010): 81–85.

23. J. L. Haddad, M. H. Goldschmidt, and R. T. Patel, "Fibrosarcoma Arising at the Site of a Retained Surgical Sponge in a Cat," *Veterinary Clinical Pathology* 39, no. 2 (2010): 241–246.

24. T. G. Moizhess, "Carcinogenesis Induced by Foreign Bodies," *Biochemistry (Moscow)* 73, no. 7 (2008): 763–775.

25. O. Ben-Izhak, H. Kerner, B. Brenner, and C. Lichtig, "Angiosarcoma of the Colon Developing in a Capsule of a Foreign Body. Report of a Case With Associated Hemorrhagic Diathesis," *American Journal of Clinical Pathology* 97, no. 3 (1992): 416–420.

26. K. Cokelaere, J. Vanvuchelen, P. Michielsen, and R. Sciot, "Epithelioid Angiosarcoma of the Splenic Capsule. Report of a Case Reiterating the Concept of Inert Foreign Body Tumorigenesis," *Virchows Archiv* 438, no. 4 (2001): 398–403.

27. T. A. Jennings, L. Peterson, C. A. Axiotis, G. E. Friedlaender, R. A. Cooke, and J. Rosai, "Angiosarcoma Associated With Foreign Body Material. A Report of Three Cases," *Cancer* 62, no. 11 (1988): 2436–2444.

28. K. Keymeulen and B. Dillemans, "Epithelioid Angiosarcoma of the Splenic Capsula as a Result of Foreign Body Tumorigenesis. A Case Report," *Acta Chirurgica Belgica* 104, no. 2 (2004): 217–220.

29. E. Ball, A. Larkin, and G. Hung, "Computed Tomography of a Canine Omental Torsion Secondary to a Chronic Abdominal Gossypiboma and Concurrent Incidental Broad Ligament Torsion," *Veterinary Radiology & Ultrasound* 65, no. 3 (2024): 193–198.

30. S. H. Kim and S. Lee, "Case Report:18F-2-Deoxy-2-Fluoro-D-Glucose Positron Emission Tomography/Computed Tomography Image Findings of a Dog With Gossypiboma," *Frontiers in Veterinary Science* 10 (2023): 1107238.

31. A. Manzella, P. B. Filho, E. Albuquerque, F. Farias, and J. Kaercher, "Imaging of Gossypibomas: Pictorial Review," *American Journal of Roentgenology* 193, no. S6 (2009): S94–S101.

32. A. Louvet and A. C. Duconseille, "Imaging Diagnosis-Ultrasound Uncommon Features of an Abdominal Gossypiboma in a Dog," *Veterinary Radiology & Ultrasound* 58, no. 6 (2017): E68–E70.

33. T. Schwarz, F. Morandi, and G. Gnudi, "Nodular Fat Necrosis in the Feline and Canine Abdomen," *Veterinary Radiology & Ultrasound* 41, no. 4 (2000): 335–339.

34. A. V. Radtke, K. M. Jorge, A. M. Townsend, R. J. Hardie, K. Jones, and S. W. Yap, "Computed Tomographic Findings in a Canine Ovarian Teratoma," *Veterinary Radiology & Ultrasound* 65, no. 1 (2024): 45–48.

35. S. Tanabe, K. Yamada, and Y. Kobayashi, "Extra-Abdominal Chondrolipoma in a Dog," *Veterinary Radiology & Ultrasound* 46, no. 4 (2005): 306–308.

36. M. McKenna, A. Suárez-Bonnet, K. Smith, and S. Stewart, "Diagnosis and Treatment of a Caecal Mucocoele in a Dog," *Journal of Small Animal Practice* 62, no. 4 (2021): 305–309.

37. A. Louvet, A. C. Duconseille, M. Gatineau, and A. Albert, "Ultrasonographic Diagnosis of a Cecal Mucocele in a Cat," *Veterinary Radiology & Ultrasound* 65, no. 6 (2024): 826–831.

38. B. K. Larson and D. Dhall, "Calcifying Fibrous Tumor of the Gastrointestinal Tract," *Archives of Pathology & Laboratory Medicine* 139, no. 7 (2015): 943–947.

39. A. B. Aregawi and A. T. Alem, "A Rare Case of Calcified Simple Mesenteric Cyst in a 70-Year-Old Woman," *Case Reports in Surgery* 2022 (2022): 8692421.

40. B. R. Weil, A. Al-Ibraheemi, S. O. Vargas, and S. J. Rangel, "Autoamputation of the Appendix Presenting as a Calcified Abdominal Mass Following Necrotizing Enterocolitis," *Pediatric and Developmental Pathology* 20, no. 4 (2017): 335–339.

41. K. Sihler, M. Mazza, L. M. Napolitano, and D. V. Feliciano, "Sharp Lower Abdominal Pain and Calcified Abdominal Mass," *Journal of Trauma and Acute Care Surgery* 78, no. 6 (2015): 1231–1233.

42. L. M. Nystrom, N. B. Reimer, J. D. Reith, M. T. Scarborough, and C. P. Gibbs jr., "The Treatment and Outcomes of Extraskeletal Osteosarcoma: Institutional Experience and Review of The Literature," *Iowa Orthopaedic Journal* 36 (2016): 98–103.

43. J. Paludo, K. Fritchie, C. L. Haddox, et al., "Extraskeletal Osteosarcoma: Outcomes and the Role of Chemotherapy," *American Journal of Clinical Oncology* 41, no. 9 (2018): 832–837.