

Carbon dioxide surgical laser versus scalpel excision of soft tissue sarcomas and mastocytomas in dogs



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Background

- A laser incision helps maintain a clear surgical field, which enhances the ability to determine proper surgical margins for tumor removal.¹
- The carbon dioxide laser coagulates and cuts tissue at the same time to minimize hemorrhage.
- Soft tissue sarcomas are a group of malignant cancers that occur in the skin or connective tissues and are considered collectively due to similar biological behavior. Completeness of surgical margins is most important for prognosis.^{2,3}
- Mastocytomas are solitary masses, ranging from benign to highly malignant, that develop on the trunk, perineal region, and limbs in predominantly older dogs. The completeness of excision must be coupled with tumor grade for most accurate prognosis.³

Hypothesis

There is no difference between laser and traditional surgical excision of cutaneous and subcutaneous soft tissue sarcomas and mastocytomas in dogs for the following parameters:

- intraoperative hemorrhage
- surgical time
- anesthesia time
- tumor cell contamination of inked margins
- surgical wound complications

Methods

- The Veterinary Health Center (VHC) computerized medical record system was used to identify canine soft tissue sarcoma (STS) and mastocytoma excision cases from December 2004 to May 2018.
- As seen in **Figure 1**, STSs (n=58) were evaluated separately from mastocytoma (n=91). There were 34 laser excisions (17 STS and 17 mastocytomas) and 115 traditional excisions (41 STS and 74 mastocytomas)
- The categorical data charted for each case included: the amount of intraoperative blood loss (ml), surgery time (min), anesthesia time (min), the presence of contaminated margins, tumor size (cm), and the occurrence of surgical wound complications.

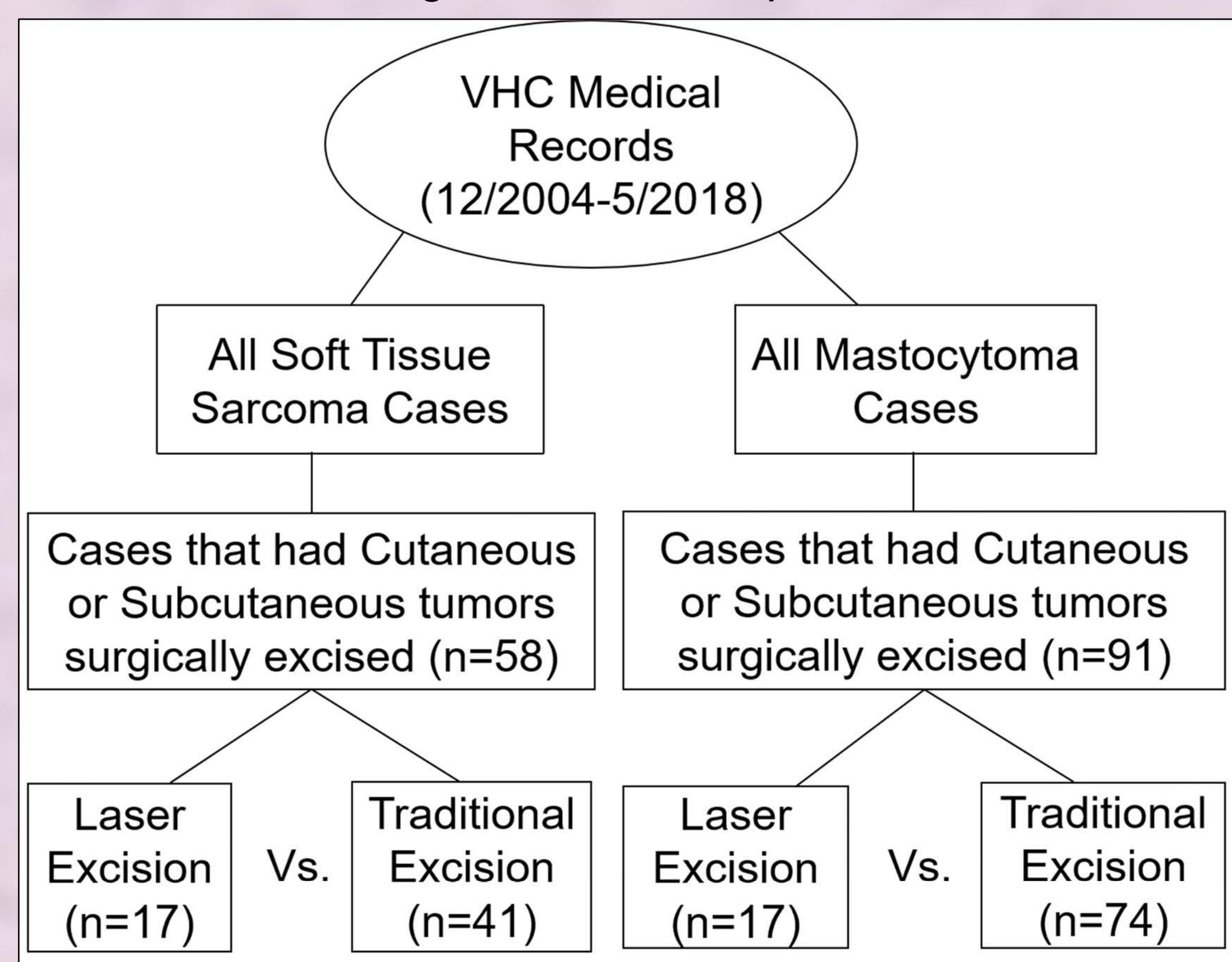


Figure 1: Methodology of the retrospective study using Veterinary Health Center medical records and population sizes of each group.



Figure 2: Recurrent thoracic wall soft tissue sarcoma removed via carbon dioxide laser excision in a dog. [Cranial is to the right; dorsal is to the top.]

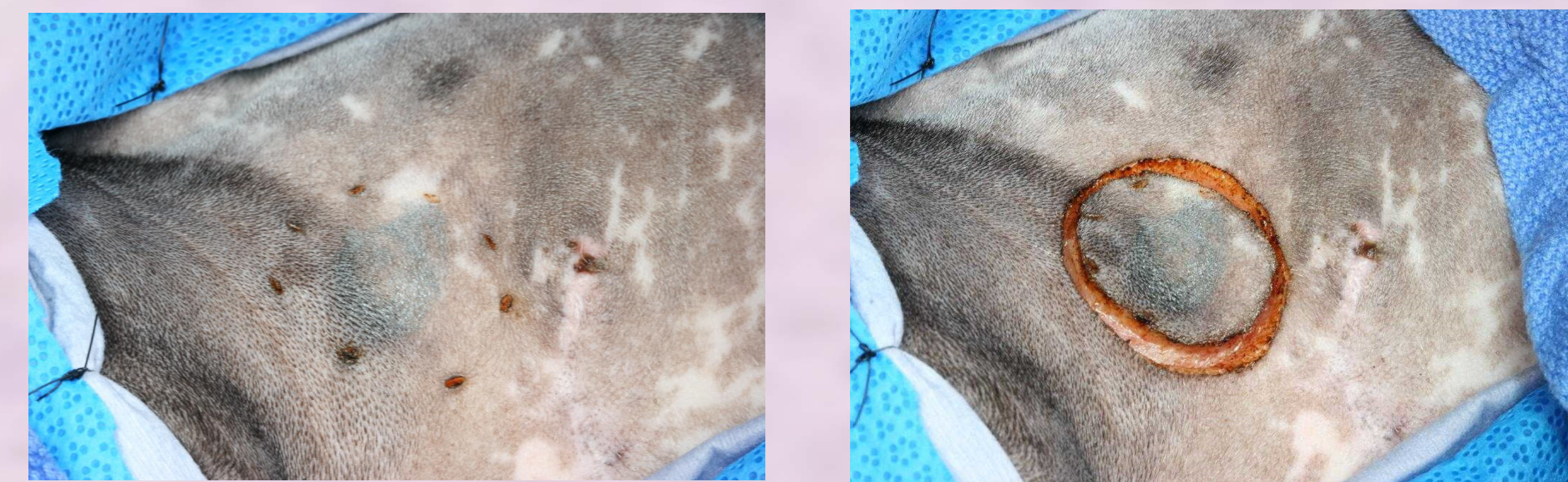


Figure 3: Left cervical mastocytoma removed via carbon dioxide laser excision in a dog. [Cranial is to the left; dorsal is to the top.]



Figure 4: Carbon dioxide laser used for oncological surgery applications.

Results

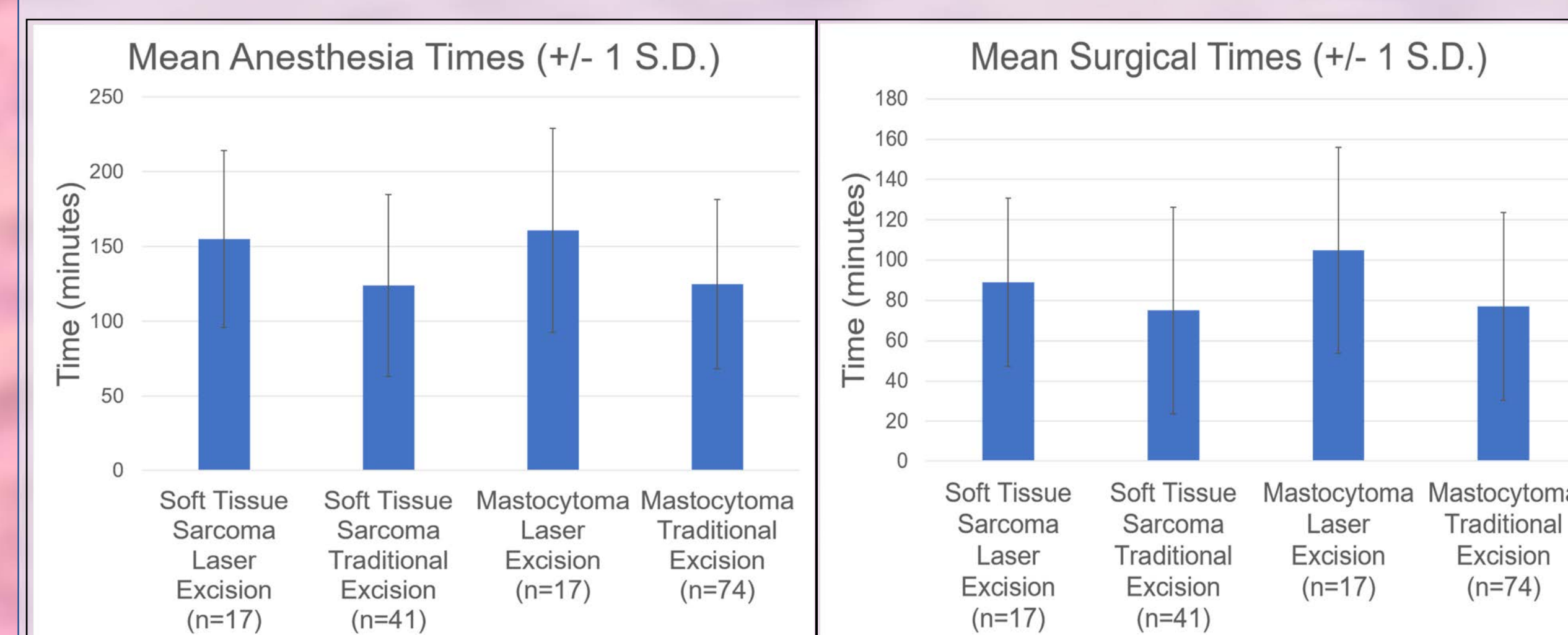


Figure 5: Duration of anesthesia and surgery for laser and traditional excision of soft tissue sarcomas and mastocytomas in 149 dogs.

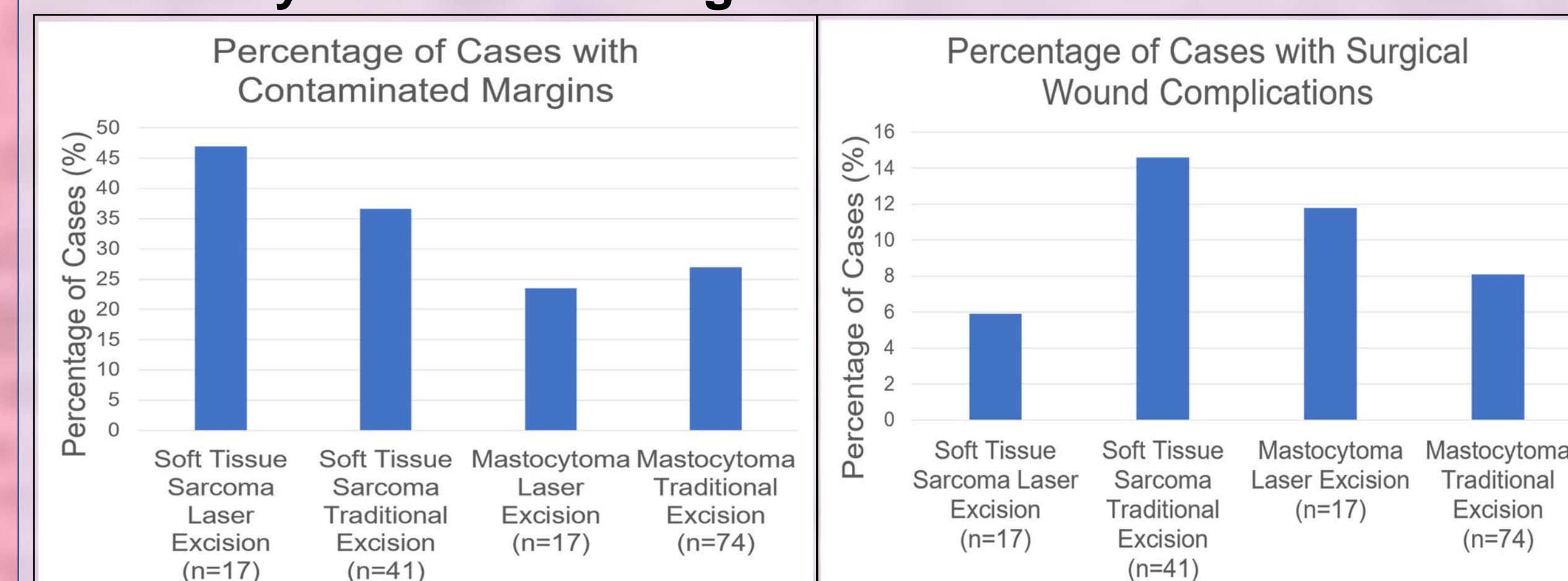


Figure 6: Percentage of cases with contaminated margins and surgical wound complications for laser and traditional excision of soft tissue sarcomas and mastocytomas in 149 dogs.

	Soft Tissue Sarcoma Laser Excision (n=17)	Soft Tissue Sarcoma Traditional Excision (n=41)	Mastocytoma Laser Excision (n=17)	Mastocytoma Traditional Excision (n=74)
Median Blood Loss (ml)	5	10	5	5
Range of Blood Loss (ml)	0-150	0-50	0-40	0-200
Median Tumor Size (cm)	3	4.8	2	2
Range of Tumor Sizes (cm)	0.5-18	0.5-25	0.5-9	0.3-18

Table 1: Intraoperative blood loss and tumor size for laser and traditional excision of soft tissue sarcomas and mastocytomas in 149 dogs.

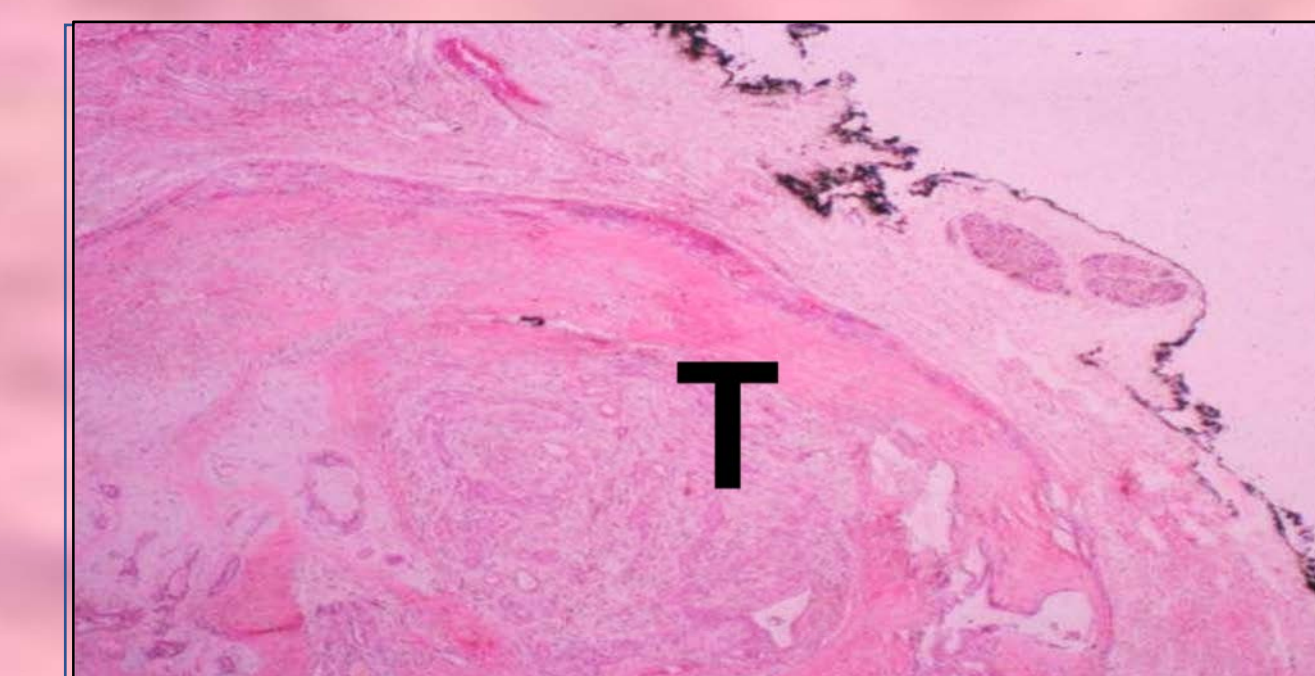


Figure 7: Tumor (T) and inked margin separated by normal tissue plane.

Conclusions

- It appears that for both tumor types there was little difference in intraoperative blood loss and tumor size.
- Laser excision took longer to perform, but resulted in fewer contaminated margins for mastocytomas and fewer surgical wound complications for soft tissue sarcomas.
- Sound conclusions cannot be made without statistical analysis of the current data and evaluation of other data collected, but not mentioned here, such as: local tumor recurrence, hospitalization length after surgery, and financial costs.

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References

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