

Injection Site Sarcoma

Extended version

Classic case: 8 year old **adult cat** with a growing **skin mass** **between the shoulder blades**

Presentation:

Adult cat (7-9 yrs) with a growing skin mass, very rare in dogs

- Firm nodular
- Non-painful
- May be hairless or ulcerated
- Located at a previous vaccination site
 - Interscapular
 - Lateral thorax
 - Dorsal lumbar
 - Flank
 - Limb
- Usually due to **INACTIVATED (killed) VACCINE adjuvant**
 - Aluminum hydroxide implicated, but not proven
 - Rabies, FeLV
- Other injections
 - Antibiotics, lufenuron, FVRCP, SQ fluids, etc
 - **Multiple injections** in one site=**risk factor**



Spc. Christine Wilde administers rabies vaccination in El Salvador

DDX:

Inflammatory vaccine reaction, granuloma, other neoplasia, abscess

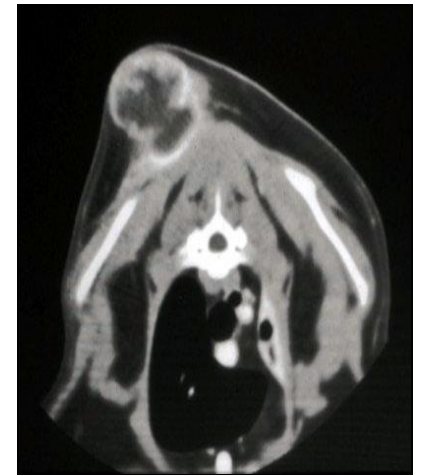
Test of choice:

Incisional biopsy (not excisional) in area to be excised with tumor

- 1-2-3 rule to biopsy
 - Increase in lump size over 1 month
 - ≥ 2 cm diameter
 - Persists > 3 months

Thoracic radiographs – check for metastases

CT or MRI – determine extent of tumor to help with complete excision



Injection site sarcoma, MRI image

Rx of choice:

Consultation with **board-certified** veterinary oncologist and surgeon **highly recommended**

First treatment has greatest chance of successful outcome with aggressive surgery and complete margins

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Rx of choice: (continued)

Aggressive surgical excision

- Distal limb or tail tumors
 - High success rate w/ amputation alone
- Other locations
 - Deep wide margins into normal tissue
 - Orient and ID tissue margins to evaluate complete removal in all planes

1. Radiation Rx:

- Treats microscopic tumor extensions (*fingers*) in normal tissues
- Decreases chance of recurrence
- Increases survival time



*Post-op, injection site sarcoma removal
Image courtesy, Wikimedia Commons
In memoriam to Willi the cat*

Complications:

- **Minimal side effects.** Signs depend on **location** (critical structures: spinal cord, kidneys, lungs) and **radiation dose**
- May confound histopath evaluation of tumor margins
- Increased post-op healing time

-AND-

2. Aggressive surgical excision with deep, wide margins into normal tissue

- **Submit tumor for histopath:**
- Orient & ID tissue margins to evaluate complete removal in all tissue planes

3. +/- Chemotherapy: (Studies have NOT shown conclusive benefit if surgery + radiation are adequate, but many specialists recommend chemotherapy)

Long term Monitoring

- Routine checkups / thoracic radiographs
- Monitor for recurrence / metastasis
- Treat side effects

Prognosis:

Better long term prognosis if 1st **surgical excision of tumor is done by a specialist** than if 1st surgical removal done by a general practice vet.

- Probably because more aggressive surgery can be done at a referral institution
- **AVOID multiple surgeries**
 - Recurrence in ½ time (sooner) after each Sx
 - Requires wider area excision; Becomes more difficult to Rx

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Prognosis: (continued)

Prognosis depends on stage and tumor location

- **Excellent prognosis if**
 - Tumor excised with wide margin of normal tissue
 - Big, but resectable tumor with aggressive surgery and radiation
- **Poor prognosis regardless of treatment if**
 - Large non-resectable tumor
 - Metastases

Prevention:

- Vaccinate at locations that allow aggressive surgical removal (**distal limbs**)
- Don't over-vaccinate
- **Use non-adjuvanted** products
- **Avoid multidose vials** and polyvalent vaccines
- Always **record injection sites** on medical record
- **Monitor** injection sites
- Discuss risks of vaccination with owner

Pearls:

- Occurrence: **1 to 10 cases per 10,000 cats**
 - Fibrosarcoma most common type diagnosed
 - Locally aggressive, invasive, high recurrence
 - Low metastasis (10-25% lungs, liver, mediastinum, abdominal organs)
- Treat tumors aggressively when small
- **Report** injection site sarcomas

Refs: Cote, Clin Vet Advisor, Dog and Cat. 2nd ed. pp 610-12, Merck Manual, 10th ed (online): Soft tissue sarcomas, Vaccine-associated feline sarcomas, Morrison, Starr and the Vaccine-Associated Feline Sarcoma Task Force, JAVMA, Vol 218, No. 5, March 1, 2001, Cat photos courtesy, Wikimedia Commons