Does Extrapulmonary Imaging Have a Role in Systemic Surveillance of Soft-Tissue Sarcoma?

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Background

Mortality from soft tissue sarcomas (STS) is caused by metastases, which occur in approximately 30% of patients. Eighty percent of STS metastases occur in the lungs, so chest imaging is universally practiced; however, guidelines on the routine use of extrapulmonary imaging are less clear.

The goals of this study were to:

- Determine the proportion of metastatic disease first presenting as pulmonary compared to extrapulmonary, or both simultaneously.
- Determine risk factors for pulmonary and extrapulmonary metastases that could be used to direct surveillance strategies.

Methods

- We performed a retrospective review of 382 patients who underwent resection of a non-metastatic STS by one of two orthopedic oncologists at a single sarcoma center between August, 1999 and December, 2018.
- All patients were routinely followed with regular physical exams and imaging surveillance as recommended by current guidelines.
- Using a multivariate regression analysis, patient characteristics (gender, body mass index, and age at excision), tumor characteristics (primary tumor location, depth, size, grade) and histopathology were evaluated as prognostic factors for developing pulmonary versus extrapulmonary metastases.

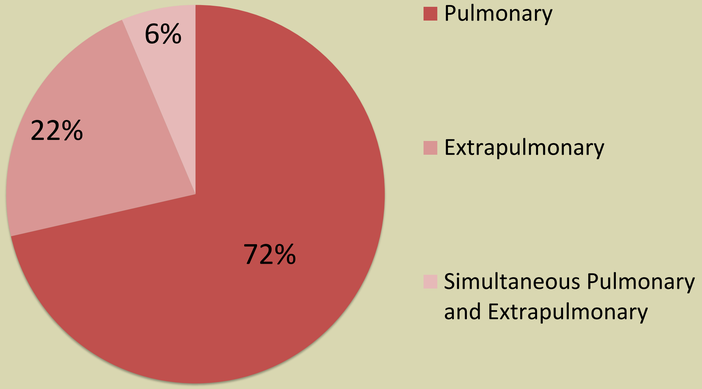

Figure 1. Proportion of patients diagnosed with initial pulmonary metastases, extrapulmonary metastases, and both simultaneously.

Location	N (%)
Bone	12 (33)
Lymph Node	9 (25)
Liver	5 (14)
Chest Wall	2 (5)
Adrenal Gland	2 (5)
Other	6 (18)

Table 1. Location of extrapulmonary metastases.

Results

- 33% (126/382) of patients developed metastatic disease.
- Of the patients with metastases, 72% (90/126) initially presented with pulmonary disease, 22% (28/126) with extrapulmonary disease, and 6% (8/126) with both. (Figure 1)
- After primary resection, initial extrapulmonary metastases were diagnosed at a median time of 22 months (IQR, 6 to 45) and were seen in 12/15 of our included histologic subtypes.
- The most common locations for extrapulmonary metastases were bone (33%), lymph nodes (25%), and liver (14%). (Table 1)
- Our regression analysis did not detect independent prognostic factors associated with an increased risk of developing new extrapulmonary metastases.

Discussion

- In our study, 22% of initial metastases were extrapulmonary; thus, CT of the abdomen and pelvis lead to earlier detection of disease progression in a substantial minority of patients.
- Other important considerations not addressed in this study include the morbidity/mortality benefit of early detection, risks associated with false positive findings necessitating additional workup, and optimal utilization of patient and health care system resources.
- Further research is needed before definitive, evidence-based recommendations regarding extrapulmonary surveillance can be made.