Objective

- Soft tissue sarcomas (STS) are among the most aggressive and chemotherapy-resistant neoplasms.
- The surgical specimen provides a unique opportunity to obtain information to individual therapy when immortalized through a murine model.
- Previous studies have been limited by small numbers, pre-clinical or laboratory settings, and subcutaneous tumor implantation.
- The present study aimed to:
  1. Determine if we could develop STS patient-derived orthotopic xenograft (PDOX) models.
  2. Identify clinical-pathologic factors associated with successful PDOX establishment.

Methods

- Within a 1 year time period (5/2015–5/2016) all 107 patients who underwent resection of a biopsy-proven of potential STS were consented prior to surgery.
- A sarcoma surgeon (FCE) obtained a portion of tumor in the operating room, which was transported fresh for surgical orthotopic implantation (SOI) in nude mice at PDOX Inc. The surgical orthotopic implantation (SOI) method has been previously described (1-4).
- Once a PDOX grew to 500 mm³ and passaged it was considered established.
- Mice without growth at 6 months were classified as a failed xenograft.
- Given that no low grade STS PDOX established, only high grade PDOX were analyzed.

Results

- 107 STS underwent SOI, 71 high grade and 36 low grade.
- Among the 71 high grade, 44 completed 6 month surveillance.
- The overall take rate for high grade STS, to date, is 64% (28/44).
- Median interval for establishment was 46.5 days.
- Take rates varied only by pre-operative therapy.
- Untreated patients were 10.1 times more likely to successfully establish a PDOX as compared to pre-treated patients (p=0.002).
- Univariate & multivariate logistic regression demonstrated that only pre-operative radiation therapy significantly impacted the likelihood of PDOX establishment (OR 0.03, p=0.002).
- Pre-operative chemotherapy did not significantly diminish successful establishment (p=0.552).

References