

# Isolated Limb Infusion as a Limb Salvage Strategy for Locally Advanced Extremity Sarcoma

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## INTRODUCTION

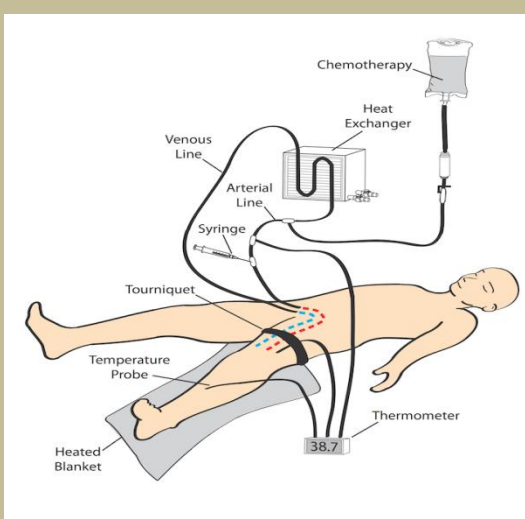
- Locally advanced soft tissue sarcoma (STS) often requires amputation for complete tumor extirpation.
- Isolated limb infusion (ILI) selectively delivers high-dose chemotherapy to the extremity in an attempt to achieve limb salvage.
- This technique involves the instillation of chemotherapy through percutaneously placed arterial and venous catheters in an extremity and tourniquet occlusion of the extremity proximal to the catheter tips.
- Chemotherapy is then circulated for 30 minutes and subsequently washed out from the limb prior to restoring circulation.

## OBJECTIVES

- To report perioperative and oncological outcomes after ILI in patients with extremity STS.

## METHODS

- IRB approved
- Multi-institutional collaborative between Moffitt Cancer Center, the Melanoma Institute of Australia, Duke University, Fox Chase Cancer Center, and Marietta Memorial Hospital
- Patients with extremity STS treated with ILI between 1994-2016.
- Patient demographics, treatment parameters and outcomes were reviewed



Grade	Description
I	No subjective or objective evidence of reaction
II	Slight erythema and/or edema
III	Considerable edema with some blistering; slightly disturbed motility permissible
IV	Extensive epidermolysis and/or obvious damage to the deep tissues, causing definite functional disturbances; threatening or manifest compartmental syndromes
V	Reaction which may necessitate amputation

Figure 1: Isolated limb infusion

Table 1: Wieberdink Toxicity Scale

Sarcoma subtype	ILI	Amputation
Undifferentiated pleomorphic sarcoma (UPS)	34 (44.2%)	20 (28.2%)
Angiosarcoma (1 epithelioid subtype)	6 (7.7%)	4 (5.6%)
Synovial sarcoma	5 (6.5%)	5 (7.0%)
Leiomyosarcoma	5 (6.5%)	6 (8.5%)
Epithelioid sarcoma	3 (3.9%)	0
Kaposi's sarcoma	3 (3.9%)	0
Myxofibrosarcoma	3 (3.9%)	9 (12.7%)
Myxoinflammatory fibroblastic sarcoma	3 (3.9%)	0
Fibrosarcoma	2 (2.6%)	2 (2.8%)
Myxoid sarcoma, NOS	2 (2.6%)	0
Clear cell sarcoma	2 (2.6%)	1 (1.4%)
Dedifferentiated liposarcoma	2 (2.6%)	0
Osteosarcoma	2 (2.6%)	11 (15.5%)
Rhabdomyosarcoma (1 alveolar subtype)	2 (2.6%)	0
Fibromyxosarcoma	1 (1.3%)	0
Ossifying fibromyxoid sarcoma	1 (1.3%)	0
Spindle cell sarcoma, NOS	1 (1.3%)	0
Chondrosarcoma	0	7 (9.9%)
Ewing Sarcoma	0	2 (2.8%)
Malignant Peripheral Nerve Sheath Tumor	0	2 (2.8%)
Hemangiopericytoma	0	1 (1.4%)
Chordoma	0	1 (1.4%)
<b>Total</b>	<b>77 (100%)</b>	<b>71 (100%)</b>

Table 2: Distribution of sarcoma histology subtype. Data presented as number of patients (percentage of cohort)

## RESULTS

### Clinicopathological Factors

- 77 patients underwent 84 ILIs at 5 institutions
- 19 patients (21 ILIs) in upper extremity
- 58 patients (63 ILIs) in lower extremity
- Median follow-up was 20.6 months

### Intraoperative and Postoperative Outcomes

- Median tourniquet time was 51 minutes
- Median hospital stay was 7.0 days
- Toxicity was low (Wieberdink I-II) after 51 procedures (60.7%)
- No amputations were performed for toxicity

### Response and Survival Outcomes

- Overall response rate (ORR) at 3 months was 58.4%
  - 29.9% complete response (CR)
  - 28.6% partial response
- 54 patients (70.1%) experienced local recurrence (in-field progression)
  - Median local recurrence-free survival (LRFS) was 6.4 months
- 26 patients (33.8%) developed distant metastases
  - Median distant metastatic free survival (DMFS) was 9 months
- Ultimately, 17 patients (22.1%) underwent amputation, with a median time to amputation of 4.5 months
- Median overall survival (OS) was 44.3 months
- Independent cohort of 71 patients who underwent amputation (without ILI) for locally-advanced STS
  - 34 patients experienced distant recurrence, with a median time to recurrence of 6.4 months

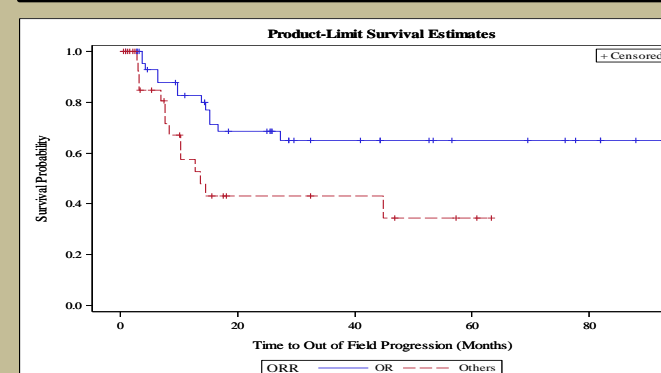


Figure 2a: Distant metastatic free survival for responders compared to non-responders

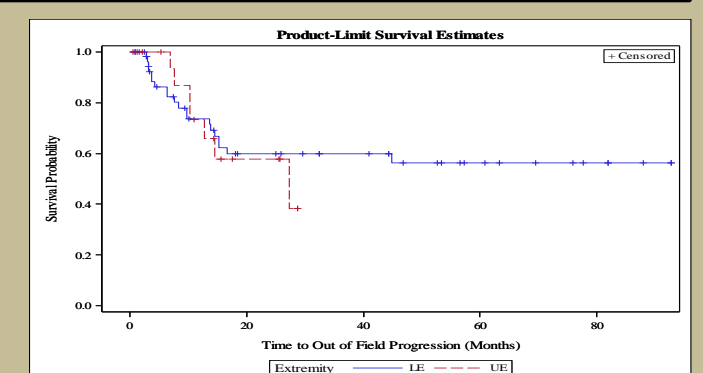


Figure 2b: Distant metastatic free survival for upper extremity compared to lower extremity ILI

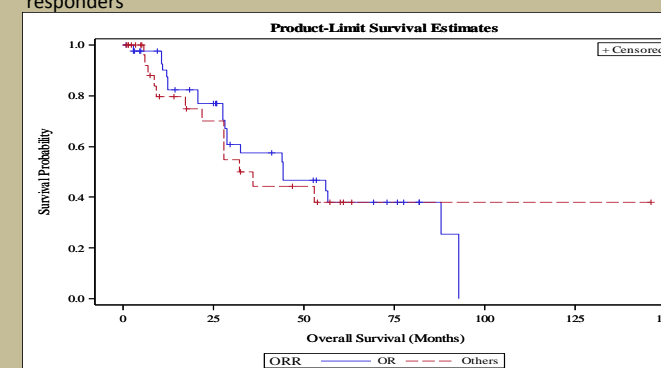


Figure 2c: Overall survival for responders compared to non-responders

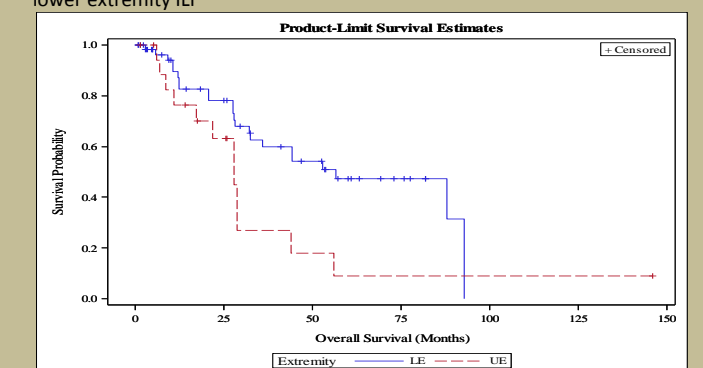


Figure 2d: Overall survival for upper extremity compared to lower extremity ILI

## CONCLUSIONS

- ILI for locally advanced STS results in an objective response for a majority of patients.
- Over the median follow-up of 20.6 months, the vast majority of patients were able to keep the affected limb
- Median overall survival and distant metastatic free survival indicate that positive long term oncologic outcome is feasible with ILI
- There is no indication that regional therapy limits survival due to untreated/unrecognized distant disease