Tumor-Specific Recurrence Rates in Patients Undergoing Liquid Nitrogen-Treated Bone Recycling Following Resection of Primary Bone Tumors: A Retrospective Study

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OBJECTIVE

Primary Objective:

- **Tumor-specific recurrence** rates in patients undergoing liquid nitrogen-treated bone recycling following resection of primary bone tumors.

Secondary Objectives:

- **Type of recurrence** developed and **outcomes** after liquid nitrogen-treated bone recycling following resection of primary bone tumors

Methods

Study Design:
Retrospective cohort study

Sample Size:
All eligible patients who underwent surgery using liquid nitrogen-treated bone recycling between January 2013 to December 2024

Sample size: **69** cases.

Inclusion criteria

- Diagnosed with a primary bone tumor (osteosarcoma, Ewing sarcoma).
- Underwent en bloc resection and reconstruction using liquid nitrogen-treated auto graft

Exclusion criteria

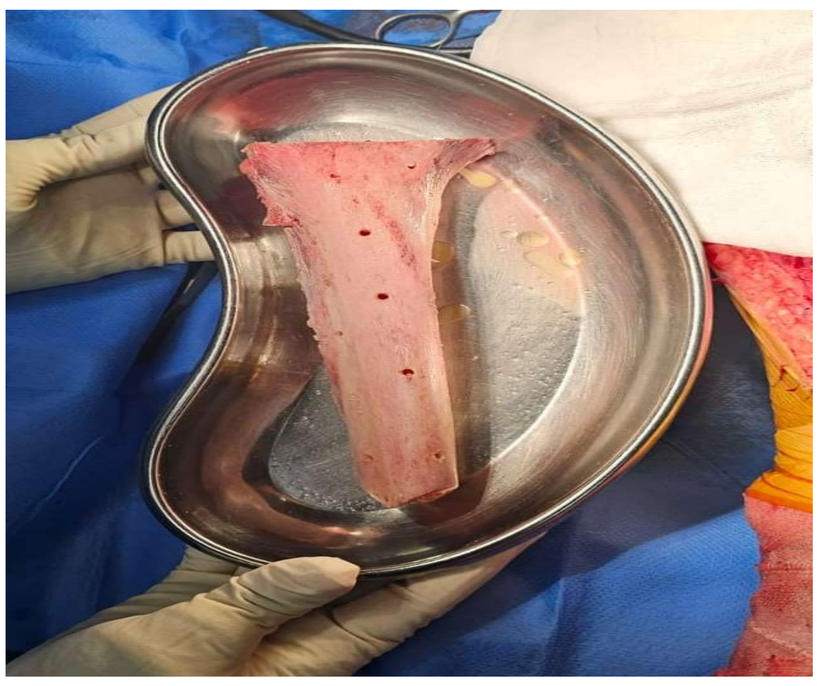
- Patients with metastatic bone disease at presentation

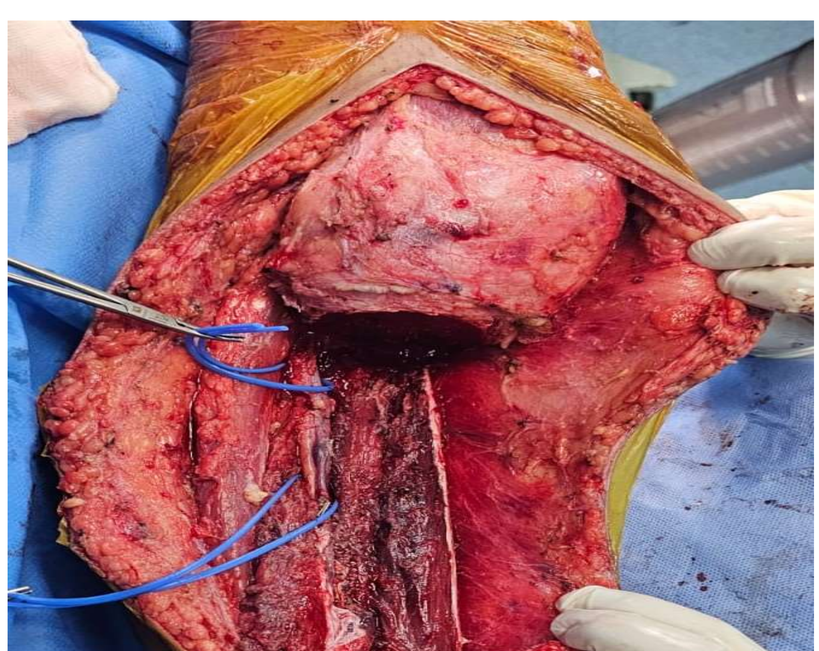
TREATMENT

Primary bone tumors including

- **osteosarcoma**
- **Ewing sarcoma**

underwent en bloc resection and reconstruction using liquid nitrogen-treated auto graft.





RESULTS

- A total of **69 patients** underwent liquid nitrogen-treated bone recycling following resection of primary bone tumors.
- A total of **16 patients** developed local and distant metastasis in one year

Type	Total no of cases	Number of recurrence
Ewing sarcoma	39	8 (20.5%)
Osteosarcoma	30	8 (26.6%)

Metastasis	Number of cases
Lung	8
Lung & Liver	1
Lung & multiple osseous	3
Brain	1
Bone & Lymph nodes	1
Iliac bone	2

- **Eleven patients (15%)** developed local recurrence, which is comparable to international studies reporting recurrence rates between 8% and 15%
- **8 patients** had amputation and were then treated on **palliative care services.**

CONCLUSION

- There is no difference in tumor type when liquid nitrogen is used for treatment
- This retrospective review shows that after primary bone sarcoma resection, reconstruction using liquid nitrogen–treated recycled auto graft is associated with a recurrence free rate of about **79.5% in Ewing sarcoma** over at least 1 years, which compares favorably to the **74.4% in osteosarcoma** recurrence free rate.