

POSTER 63

Risk Factors Impacting the Incidence of Local Recurrence of Atypical Lipomatous Tumors of the Extremity

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Background and Significance:

Liposarcoma (LPS) is one of the most common types of soft tissue sarcoma (STS) found in adults, with the Atypical Lipomatous Tumors (ALT)/ Well-differentiated liposarcoma (WDLPS) histological subtype comprising 40 to 45% of all LPS^{1,2}. While possessing no risk for metastatic spread, ALTs have demonstrated a high incidence of local recurrence (LR)³. Given the high recurrence rate of ALTs, it is important to identify risk factors associated with local recurrence⁴. Two potential risk factors that are difficult to identify from large, multi-institutional datasets and may be underappreciated is whether the tumor was removed piecemeal versus as one encapsulated mass, and whether the tumor demonstrates a muscle-infiltrating pattern or appears more encapsulated and well-circumscribed at the time of surgery and on axial imaging.

Purposes:

1. Review our institutional experience with ALT of the extremity and examine the following risk factors we think may impact the incidence of LR: Encapsulated versus piece-meal excision based on pathology and operative reports, recurrent tumors and MRI evidence of muscle infiltrative pattern.
2. Identify patients with LR of ALTs and time to local recurrence through chart review
3. Review patients' pre-operative MRI to evaluate for an encapsulated, well-circumscribed look versus a more infiltrative pattern.
4. Use the information gleaned from the study to help determine appropriate surveillance regimens.

Methods:

A retrospective review of patients ≥ 18 years old with a diagnosis of ALT of the extremity, trunk, pelvis, or buttock treated at our institution from 2002-2020 was performed. Patients with ALT of the retroperitoneum and with no pre-operative MRI or CT imaging, operative or pathology report in our Electronic Medical Record (EMR) were excluded. Following excision, patients were instructed to return for surveillance MRI or CT imaging at 6-12-month intervals depending on the provider. We looked at three cohorts of patients. The first included patients with ALT treated with surgical resection and had a minimum 2 year follow up post resection, the second included patients whose ALT was surgically resected but had < 2 years follow up post resection and the third cohort included patients who presented with a diagnosis of recurrent ALT and had their initial surgery at an outside institution. Each patient's pre-operative MRI was reviewed by 4 providers including MSK oncologists and MSK radiologists. Pathology and operative reports were reviewed to determine whether the tumor was excised piece-meal or as an encapsulated mass.

Results:

112 patients were identified and 36 patients met our inclusion criteria. 14 patients had a minimum 2-year imaging follow up (24-138 months), 12 patients were identified with < 2 -year imaging follow up and 10 patients presented with LR from an outside institution. Mean age of diagnosis was 65 years old. The majority (72.2%) of ALTs were located in the thigh. Mean tumor size on MRI was 20.8 cm \pm 7.3 cm. 1 patient with a minimum 2 year follow up and 3 patients presenting with LR received radiation therapy. 85.7% of the ALTs were marginally excised while 14.3% were widely excised. Based on the operative and pathology reports, 78.5% of ALTs were removed as an encapsulated mass and 21.5% were removed piece-meal. In the group with ≥ 2 year follow up, there was evidence on MRI of a muscle infiltrative pattern in 10 patients, and in 4 patients, the tumor was both well-circumscribed and infiltrative in areas. The overall recurrence rate in the cohort of ALT patients with ≥ 2 year follow up was 28.5% with the mean time to recurrence being 67 months, ranging from 12-138 months. No patient with < 2 year follow

up had LR. In patient's whose tumor was excised piece-meal, 67% of the ALTs recurred at a mean time of 35.5 months while 18.8% of ALTs excised as an encapsulated mass recurred in a mean time of 98 months. Of the 4 recurrences identified from the encapsulated excisions, 3 had an infiltrative pattern on MRI. 4 patients in the LR cohort had multiple recurrences with 3 patients having ≥ 4 total LR. Findings of residual tumor was found on first imaging post-resection in 6 patients with LR occurring in 1 patient.

Conclusion:

In this retrospective study identifying risk factors for local recurrence, ALTs excised piece-meal and with an infiltrative pattern on MRI demonstrated a higher incidence of local recurrence suggesting tumors with these characteristics be followed more closely. However, there was LR of encapsulated masses excised marginally as well, and these masses warrant long-term surveillance. In addition, patients with a history of LR should be followed more closely given the markedly higher LR rates.

References:

- 1 Ng VY, Scharschmidt TJ, Mayerson JL, Fisher JL. Incidence and survival in sarcoma in the United States: A focus on musculoskeletal lesions. *Anticancer Res.* 2013;33(6):2597-2604.
- 2 Thomas DM, Conyers R, Young S. Liposarcoma: Molecular genetics and therapeutics. *Sarcoma.* 2011;2011. doi:10.1155/2011/483154
- 3 Weiss SW, Rao VK. Well-Differentiated Liposarcoma (Atypical Lipoma) of Deep Soft Tissue of the Extremities, Retroperitoneum, and Miscellaneous Sites. *Am J Surg Pathol.* 1992;16(11):1051-1058. doi:10.1097/00000478-199211000-00003
- 4 Presman B, Jauffred SF, Kornø MR, Petersen MM. Low Recurrence Rate and Risk of Distant Metastases following Marginal Surgery of Intramuscular Lipoma and Atypical Lipomatous Tumors of the Extremities and Trunk Wall. *Med Princ Pract.*2020;29(3):203-210. doi:10.1159/000503621