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# Comparable safety profile between neuro-oncology procedures involving stereotactic needle biopsy (SNB) followed by laser interstitial thermal therapy (LITT) and LITT alone procedures

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## Abstract

**Introduction:** Tissue diagnosis through stereotactic needle biopsy (SNB) is often needed prior to laser interstitial thermal therapy (LITT). Whether these procedures should be performed in the same surgery or in separate settings remain unclear. As a first step to address this question, we assess safety profile of procedures involving LITT alone versus SNB + LITT.

**Methods:** Using International Classification of Disease (ICD) codes, we queried the National Readmissions Database (NRD, 2010-2018) for malignant brain tumor patients who underwent either (1) LITT alone or (2) elective LITT in combination with SNB (SNB + LITT). Survey regression methods were utilized. Additionally, the procedural outcome of LITT or SNB + LITT performed by the senior surgeon (2014-2022) were reviewed.

**Results:** During the study period, an estimated 678 malignant brain tumor patients underwent LITT alone versus 373 patients that underwent SNB + LITT. Patients undergoing LITT and SNB + LITT exhibited statistically comparable median lengths of hospital stay (IQR; LITT = 2 day [1, 3]; SNB + LITT = 1 day [1, 3];  $p = 0.405$ ) and likelihood of routine discharge (LITT = 73.5%; SNB + LITT = 81.1%;  $p = 0.068$ ). The odds of 30-day medical or neurological readmissions were comparable between LITT and SNB + LITT treated patients (all  $p \geq 0.793$ ). In the single surgeon experience of 218 procedures performed over an eight year period (2014-2022), the complications (LITT = 3.9%; SNB + LITT = 2.6%,  $p = 0.709$ ), discharge within 48 h (LITT = 84.5%; SNB + LITT = 87.8%;  $p = 0.556$ ), routine discharge (LITT = 91.3%; SNB + LITT = 93.9%;  $p = 0.604$ ), and unplanned 30-day readmission (LITT = 3.9%; SNB + LITT = 1.7%;  $p = 0.423$ ) were similarly comparable between LITT and SNB + LITT.

**Conclusion:** The length of hospital stay, the likelihood of routine discharge, and 30-day readmission for malignant brain tumor patients who underwent LITT and SNB + LITT were comparable.

**Keywords:** Brain tumor; Laser interstitial thermal therapy (LITT); Readmissions; Stereotactic laser ablation (SLA); Stereotactic needle biopsy (SNB).

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