

Checklist: Clinical Protocol for Laser-Excised Specimen Handling

This checklist is designed for surgical oncology teams and pathology departments to ensure diagnostic integrity when utilizing laser technology for biopsies.

I. Intraoperative Preparation (Surgical Team)

- **[] Langer's Lines Identification:** Map the skin tension lines at the biopsy site.
- **[] Perpendicular Tension Applied:** Manually spread the skin at a 90-degree angle to Langer's lines.
 - *Rationale:* Creates a natural elliptical wound to minimize scarring and "dog ears."
- **[] Surgical Tape Stabilization:** Secure the spread skin with tape to maintain tension during computer-guided ablation.
- **[] Computer Shape Alignment:** Align the digital path (0.001" stroke width) with the physical boundary projected on the skin.
- **[] Orientation Marking:** Place a suture or permanent marker at the 12 o'clock position *before* final excision to assist the pathologist in orientation.

II. Post-Excision Stabilization (Nursing/Surgical Staff)

- **[] Immediate Fixation:** Submerge the specimen in 10% Neutral Buffered Formalin (NBF) immediately upon removal.
- **[] Fixative Ratio Check:** Ensure a minimum ratio of 10 parts formalin to 1 part tissue.

- [] **Labeling:** Clearly mark the container as "Laser Excision" to alert the pathologist to potential thermal artifacts.

III. Gross Examination (Pathology Lab)

- [] **Differential Inking:** Apply multiple ink colors to specific margins (e.g., Deep = Black, Superior = Green) to distinguish surgical boundaries from laser-charred areas.
- [] **Thermal Zone Measurement:** Document the thickness of the carbonized "char" layer in the gross report.
- [] **Incision Quality Review:** If the charring exceeds 0.5mm, flag the specimen for "Deep Levels" sectioning.

IV. Microscopic Evaluation (Pathologist)

- [] **Artifact Identification:** Distinguish between "streaming" nuclei (thermal stretching) and true cellular dysplasia.
- [] **Coagulative Necrosis Exclusion:** Disregard the narrow band of eosinophilic tissue at the immediate margin when grading tumor cells.
- [] **Margin Status Reporting:** Explicitly state if margins are:
 - *Clear:* No tumor within the defined margin.
 - *Involved:* Tumor present at the edge.
 - *Obscured:* Thermal artifact prevents definitive assessment.

- [] **Ancillary Testing (If Needed):** Order IHC markers (e.g., p16, cytokeratins) if thermal damage obscures standard H&E morphology.

V. Troubleshooting & Quality Control

- [] **Feedback Loop:** If artifacts are consistently high, notify the surgeon to:
 - Increase programmed speed (mm/s).
 - Switch to Super-Pulse mode.
 - Re-calibrate the laser focal point.

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