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CORR Insights®: Are Biopsy Tracts a Concern for Seeding and Local Recurrence in Sarcomas?

Michelle Ghert MD, FRCSC

Where Are We Now?

For patients with a bone or soft-tissue sarcoma, the critical step in directing treatment and determining prognosis is a tissue biopsy. Biopsies are commonly done by core needle biopsy with radiological assistance (ultrasound or CT scan), or by open surgical biopsy. Both methods generally provide sufficient

material to determine a diagnosis, although open biopsy is more likely to do so at the cost of greater morbidity [1, 12]. Once a diagnosis is obtained and the definitive surgical resection is planned, the surgeon must decide whether or not to resect the biopsy tract along with the tumor. Due to the larger exposure and higher volume of exposed tumor tissue in surgical biopsies compared to needle biopsies, the risk for biopsy tract seeding with tumor cells is higher for open biopsies than for core needle biopsies. Fortunately, open-biopsy tracts are generally easy to see and resect; for this reason, and because of the increased risk of seeding associated with them, surgeons accept that open biopsy tracts should be excised at the time of the definitive tumor resection.

But the need to excise core needle biopsy tracts has not been proven. In their single-center series of 180 patients, Barrientos-Ruiz and colleagues pathologically identified biopsy tract

seeding in 20 of 62 open biopsies and one of 118 core biopsies. Of the 21 cases in which the biopsy tracts were contaminated, only those of the 20 open biopsies resulted in a local recurrence. In light of this, we do not need a slew of p-values to demonstrate that core needle biopsies are less likely to spill tumor cells along the biopsy tract. Since local recurrence is directly related to the adequacy of tumor removal [10], and since the risk for “leaving tumor behind” is negligible with core biopsies, it seems reasonable to conclude that core needle biopsy tracts do not require excision.

The study by Barrientos-Ruiz and colleagues confirms previous findings that have indicated that excision of a core needle biopsy tract is not necessary [3, 11]. This is important because the excision of a tract that is not easily visualized, if it can be identified at all, can be challenging and can result in surgical morbidity. Given that core biopsies are, in most cases, adequate to provide a diagnosis [1], result in less morbidity, and possibly lower risk for local recurrence, it also seems a logical conclusion that open biopsies should be reserved only for cases in which a diagnosis cannot be obtained by core needle biopsy.

This CORR Insights® is a commentary on the article “Are Biopsy Tracts a Concern for Seeding and Local Recurrence in Sarcomas?” by Barrientos-Ruiz and colleagues available at: DOI:10.1007/s11999-016-5090-y.

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M. Ghert MD, FRCSC (✉)
Department of Surgery, McMaster
University and Hamilton Health
Sciences, 711 Concession Street,
Hamilton, ON L8V 1C3, Canada
e-mail: ghert@hhsc.ca

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Where Do We Need To Go?

If the field is to move more definitively towards core-needle biopsies, as suggested by Barrientos-Ruiz and colleagues, it is imperative to identify the situations in which a core needle biopsy tract should be excised. Tumors considered especially “implantable” such as chondrosarcoma [5, 7] might provide an indication for biopsy tract removal. In addition, sarcomas treated with preoperative chemotherapy or radiation are less likely to have viable tumor cells in the tumor itself or biopsy tract [4, 8]. Therefore, those patients who are not treated with preoperative radiation or chemotherapy might be better candidates for biopsy tract resection.

The other important questions to answer would be how to excise a biopsy tract that was created by a physician other than the surgeon who performs the definitive resection, one that is not easily seen on the skin surface, or one that involved multiple deep passes to obtain tissue from diverse areas of the tumor mass? The authors of the current study used India ink on the skin to mark the biopsy site, and planned their surgical procedures and biopsy tract excision by consulting with radiology images of the biopsy in which the biopsy tract could be identified. However, the authors relied heavily on tactile identification of the

deep scar, which is unlikely to be accurate. Given such uncertainty, it seems important to develop a method to accurately identify a core needle biopsy site during surgery.

How Do We Get There?

Although animal models in cancer research tend to be disappointing with respect to developing effective treatment options [9], these models can be helpful in anatomical or pathologic studies. For instance, a xenograft model of implanted sarcoma subtypes could be used to determine which types of tumor are most likely to survive in and seed a biopsy tract. Given the many xenograft options [2, 5, 6] and the ability to replicate the experiments and evaluate in a blinded fashion, this approach may inform clinical decision-making. In addition, various dye or fluorescent techniques could be assessed in animals to determine the feasibility of visually marking the biopsy tract.

Given the difficulties in identifying the biopsy tract itself, it may be challenging to perform prospective studies comparing excision versus nonexcision of core needle biopsy tracts in different sarcoma populations in order to definitely determine the risk of biopsy tract seeding for each sarcoma subtypes. In addition, this type of

research may not resonate with the orthopaedic oncology community, which for the most part, does not routinely excise core needle biopsy tracts [3, 11], and thus may not be willing to participate in such a study.

Until the high-risk cases for biopsy seeding can be more-convincingly identified and the method of biopsy tract identification can be developed, orthopaedic oncology surgeons will continue to practice based on the current available retrospective evidence (such as that provided by Barrientos-Ruiz and colleagues), clinical experience and expertise, and on patient preferences.

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