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CT ARTHROGRAPHY PRIOR TO CT GUIDED BONE LESION BIOPSY, A CASE REPORT

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ABSTRACT

Background: Suspicious bone lesions are very common and often need a pathohistological verification. Surgical (open) and percutaneous image guided biopsies can be used to get a sample for pathology analysis. As the barriers of lesion compartment shouldn't be crossed due to risk of dissemination, transarticular approach is not advised.

Case study: We present a case of 57-year-old female patient with lung cancer history and left knee pain. Lytic lesion in lateral femoral epycondile with fluorodeoxyglucose (FDG) uptake was confirmed by positron emission tomography with computed tomography (PET/CT). Surgical biopsy was performed and pathohistological analysis showed no tumor cells. A month later a computed tomography (CT)-guided percutaneous bone biopsy with CT arthrography was performed and pathohistological analysis confirmed metastatic lesion.

Conclusion: CT-guided percutaneous bone biopsy is a safe, effective and minimally invasive procedure. CT arthrography can add some additional information for anatomical positioning in order to avoid transarticular approach in reaching the targeted lesion.

KEYWORDS: Metastatis, Bone Neoplasms, Interventional Radiology, Image-Guided Biopsy, Orthopedics

INTRODUCTION

Suspicious primary bone tumors or bone metastasis constitute frequent indications for pathohistological analysis. Specimens for pathohistological analysis can be obtained by surgical (open) biopsy or core needle biopsy. In order to perform a safe bone biopsy anatomy knowledge is crucial. Biopsy route should avoid neural, vascular and visceral structures [1]. The presumptive decision to approach a lesion as metastasis of a known primary neoplasm without pathohistological confirmation may erroneously lead to inappropriate treatment of benign diseases or incorrect management of a second primary tumor. We report a case of a female patient with lung cancer history and femoral suspicious bone lesion. CT-guided bone biopsy with CT arthrography was indicated after unsuccessful open bone biopsy.

CASE STUDY

A 57-year-old female patient presented with left knee pain which was not related to trauma. Six months prior she underwent left superior lung lobe resection. She also underwent four cycles of chemotherapy. On the left knee x ray a lytic lesion in lateral femoral epycondile was noted. The lesion showed FDG uptake on PET/CT (Figure 1).

She was referred to orthopedic department and decision to make surgical biopsy was made. Pathohistological analysis of surgically obtained specimens showed no tumor cells. A month later, multidisciplinary team decided to refer the patient to radiology department for the CT-guided bone biopsy under local anesthesia. For the purpose of planning biopsy, 15 ml of iodinated contrast and 15mL of saline solution was injected into the knee joint under ultrasound-guidance. CT arthrography performed immediately after the contrast application, showed lytic lesion in femoral lateral epicondyle and bone defect after surgical biopsy above the lesion (Figure 2a). CT arthrography depicted the joint space and helped to plan a safe approach to the lesion., without passing through joint space (Figure 2b). After the biopsy needle tip was adjacent to the lesion, which was confirmed by a CT scan (Figure 2c), biopsy was performed (Figure 2d) After one-hour of observation the patient was discharged home.

Pathohistological analysis confirmed metastatic lesion from lung origin (adenocarcinoma) and the second line of chemotherapy was started. Follow up PET/CT showed no metabolic activity in the biopsy tract, which excluded seeding with tumor cells.

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DISCUSSION

CT-guided bone biopsy is a safe, accurate and minimally invasive method to define the diagnosis [2-6]. CT arthrography is a complementary method by which a safe biopsy approach can be planned without passing through the joint space. Core needle biopsy yields diagnostic results comparable to open biopsy [7]. The rate of complications in CT-guided biopsies is very low (1.1%), while in open biopsies it may be up to 16% [8]. The diagnostic accuracy is variable according to the location of the lesion, where accuracy is higher for lesions located in the extremities and pelvic bone than the lesions located in the vertebral column [9]. In the literature, the rate of diagnostic definition of percutaneous biopsies of musculoskeletal lesions is 69-93% [10-15].

Although the lesion is approached through coaxial needle, transarticular approach is not recommended [16] due to risk of dissemination and even potentially infection [17]. Consequentially CT arthrography was performed to plan a safe approach to the lesion, without crossing joint space with the biopsy needle. Iodine contrast was injected under ultrasound guidance to reduce further radiation. As to our best knowledge this is the first case of periprocedural arthrography during the bone lesion biopsy.

CONCLUSION

CT-guided bone biopsy is safe and effective procedure that yield diagnostic accuracies up to 93%. It is minimally invasive procedure, that can be done outpatient under local anesthesia. Open biopsies should be performed only if CT-guided biopsies are not possible due to lesion localization. Although CT guided biopsy remains a golden standard, CT arthrography can be used as an additional tool in case of periarticular bone lesions to define anatomical structure more clearly.

CONFLICT OF INTEREST:

The authors declare that there is no conflict of interest.

The patient gave her informed consent prior to her inclusion in case report.

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FIGURES

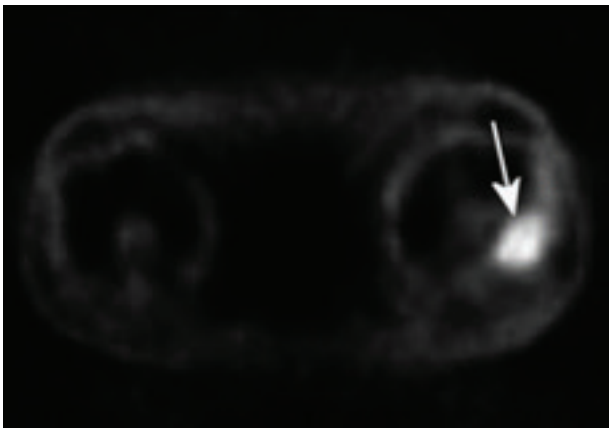

Figure 1. PET/CT identifies area of major metabolic activity in the left lateral femoral epicondyle.

Figure 2. Pre-biopsy CT (2a) – sagittal reconstruction shows lytic lesion in lateral femoral epicondyle (arrow), bone defect after open biopsy (arrowhead), intraarticular iodinated contrast agent (star). 3D Volume Rendering Technique (VRT) (2b) with demarcation of intraarticular space (arrows). CT during biopsy (2c) – biopsy needle tip on the edge of the lytic lesion. Postprocedural CT (2d) – small amount of air inside the lytic lesion in the field of biopsy which is a normal postprocedural finding (arrow).