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Title of the presentation: CT SCAN GUIDED BONE BIOPSY AT A GLANCE WITH CASE OF PELVIC BONE MASS

PRESENTING AUTHOR : Dr. Chandresh Thummar (2st Year Radiology Resident)

CO-AUTHOR: Dr. Dhanshree Mehta (2st Year radiology Resident)

UNDER GUIDANCE OF : Dr. Ila D. DesaiProfessor & Head, Dept. of Radiodiagnosis

INSTITUTION : CIVIL HOSPITAL , AHMEDABAD

B. J. MEDICAL COLLEGE- AHMEDABAD

Introduction/ Review of Literature:

- CT guided bone biopsy is safe and cost effective technique.
- CT biopsy is performed using a co-axial needle technique to gain a stable position through which the biopsy performed.
- If the bony cortex is destroyed then typically a standard tru cut biopsy set will be used to take soft tissue material and bone fragments.
- If the cortex remains intact 'bone biopsy needles', such as

  Jamshidi and Bonotopy etc. are required to take fragment of bone in toto.

Aims/ Objectives:

- To evaluate role of CT guided biopsy in nature of lesion, definitive diagnosis and treatment of primary bone tumour.
- For prognosis of post treatment patient.

CLINICAL PRESENTATION :

- A 38 year old female presented with complains of severe pain in left leg and left lumbar region and limping (difficulty in walking) with localized tenderness since 10 months.On Clinical examination : localized tenderness in left lumbar region , and gluteal region , decreased ROM and difficulty in walking.

X-ray : Ill-defined expansile lytic sclerotic lesion is noted involving left iliac bone and acetabulum with internal septations, lesion shows wide zone of transition. Lesion cause cortical breech at few places.

-**CT** : Ill-defined expansile lytic sclerotic lesion is noted involving left iliac bone and acetabulum. Lesion shows internal soft tissue component. Lesion cause cortical breech at few places.

-**PROVISIONALD/D**: Primary malignant bone lesion – Chondrosarcoma

- Then patient is sent for bone biopsy for histopathology to confirm diagnosis.

Methodology:

CONSENT : After explaining all aspect of procedure , written and verbal consent of patient and relatives is taken.

PRE PROCEDURE PLANNING AND LAB. INVESTIGATION : Review of CT and other relevant imaging (X-RAY etc.) to clarified lesion that to be biopsied is done.Complete blood count and coagulation studies is within normal range.

EQUIPMENTS :

- Bone biopsy needle (Jamshidi needle) – Ostycut bone biopsy needle (14 G)
- Needle with syringe and gauze pieces etc.

POSITION: Position and approach to lesion is decided based on location and adjacent relation to major vessels and muscles with help of previous investigation .

PLANNING AN ACCESS ROUTE :

- A radiopaque needle or skin marker used to focus optimal access point after that preliminary CT images of region of interest are taken.Shortest route from skin to tumor is marked with avoiding major neural , vascular structure. Entry point and needle trajectory plotted on axial CT cuts , using pen marker for skin entry point.

MONITORING : Patient is connected to monitors that track heart rate, blood pressure, oxygen level etc.

TECHNIQUE : Povidone iodine painting and Chlorhexidine antiseptic solution cleaning done with adequate antibiotics prophylaxis , followed by draping.

- Biopsy trajectory is anesthetized with 1% lignocaine/lidocaine from skin to periosteum using 22G spinal needle. This needle is then repositioned at soft tissue-tumor interface and confirmatory scan is taken for accurate trajectory of needle.

- A nick in skin made with scalpel blade. Bone biopsy needle is introduced gradually with frequent scan to check and for correction of needle trajectory (in case of cortex perforation surgical hammer is used)

- At level of periosteum local anesthesia is given. Needle is introduced further into lesion of interest

- Stylet is removed and soft tissue is aspirated with 10 cc syringe and soft tissue component and bone fragments is separated by pouring Heparin + N.S. / N.S. solution and then taken in 10% formalin for histopathological examination.Needle is further advanced by rotatory movement into bone tissue proper to take chunk of proper bone tissue within hollow inner bore of needle, similarly 3 to 4 bone tissue samples are taken.

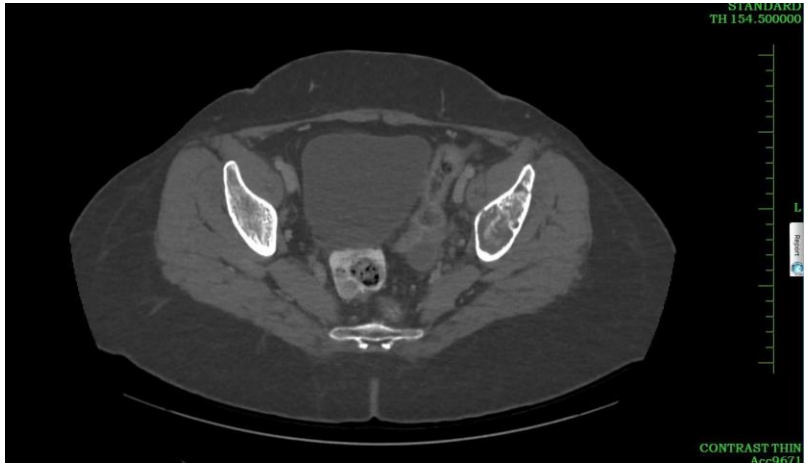
POST PROCEDURE CARE : Immediately after last sampling , compression is applied followed by dressing. Post procedural CT to check for immediate post procedural complications such as soft tissue swelling and hematoma. Adequate analgesics and antibiotics for postprocedural pain and infection control. Patient is kept under observation with vital monitoring every 30 minutes for 4 hours and Bed rest advised for 4 hours . The follow-up time is 1 months.

Results:

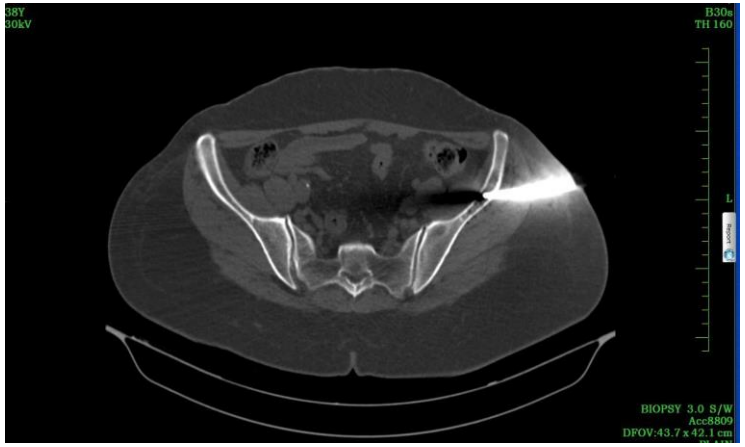
- Histopathological results for this biopsy comes out to be positive which is - ‘Chondrosarcoma - Grade 1/2’ .
- Then patient was started on definitive treatment by respective clinician.

Representative images:

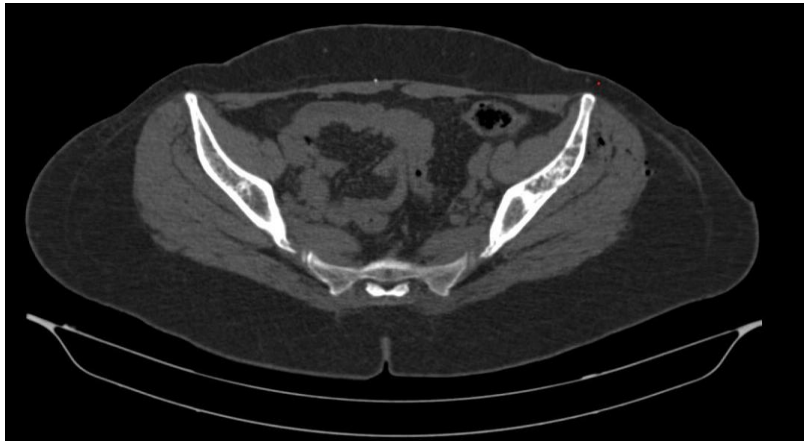
X-RAY PELVIS AND B/L HIP:
Ill-defined expansile lytic sclerotic lesion is noted involving left iliac bone and acetabulum, lesion shows wide zone of transition. Lesion cause cortical breech at few places. Lesion doesn't shows any external soft tissue component or periosteal reaction.



CECT ABDOMEN & PELVIS :
Ill-defined expansile lytic sclerotic lesion is noted involving left iliac bone and acetabulum. Lesion shows multiple internal septations. Lesion cause cortical breech at few places . Lesion doesn't show any periosteal reaction. Lesion shows internal soft tissue component.



CT image during procedure: Left sided bony lesion with tip of bone biopsy needle within lesion of interest with best possible needle trajectory route



CT image of post procedure: There is no evidence of any immediate post biopsy complication like hematoma or major hemorrhage etc. noted.

- Conclusion:
- CT guided biopsy has better procedural planning as it permits multiplanner reformation to obtain more adequate path of needle
- CT guided biopsy is useful in diagnosis of bone lesion to differentiate between primary bone lesion or metastatic and benign or malignant lesions.
- Help the clinician to its definitive treatment.
- For prognosis of underlying treated cases.

ADVANTAGE OF CT GUIDED BONE BIOPSY

- Provides good visualization of bone and surrounding soft tissues
- Help avoiding damage to adjacent vascular , neurological and visceral structures
- Allows precise needle positioning and avoiding unnecessary adjacent injuries
- Relatively safer and cost effective procedure with fairly good diagnostic accuracy

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