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Clinic based biopsy vs. theatre biopsy of bone and soft tissue extremity tumours: comparable diagnostic modalities

Waseem Ahmed
Aga Khan University, waseem.ahmed@aku.edu

masood umer
Aga Khan University, masood.umer@aku.edu

Yasir Mohib
Aga Khan University, yasir.mohib@aku.edu

Rizwan Haroon Rashid
Aga Khan University, rizwan.haroonrashid@aku.edu

ORIGINAL ARTICLE

Clinic based biopsy vs. theatre biopsy of bone and soft tissue extremity tumours: comparable diagnostic modalities

Waseem Ahmed, Masood Umer, Yasir Mohib, Rizwan Haroon Rashid

Abstract

Objective: To compare the diagnostic accuracy of clinic-based biopsy versus theatre biopsy against final histopathology in patients presenting with extremity tumours.

Methods: The retrospective study was conducted at Aga Khan University Hospital, Karachi, and comprised record of patients who underwent biopsy procedure of extremity tumours from January 2008 to December 2011. Data regarding socio-demographic status, disease-related and procedure-related variables were collected from the files. Histopathology report of biopsy was compared with the final histopathology after definite procedure of the tumour for concordance.

Results: Of the 87 patients whose records were reviewed, 42(48%) had undergone biopsy in theatre and 45(52%) in clinic. The overall median age was 29 years (Inter-quartile range: 18-58 years). As compared to final histopathology after the definite procedure, diagnostic accuracy of theatre and clinic-based biopsy was 97.7% vs. 95.5% respectively. Surgical site infection was observed in 2(5%) in theatre and in 1(2.2%) in clinic.

Conclusion: Clinic-based biopsy was accurate and safe with diagnostic accuracy comparable to theatre-based biopsy. Clinic-based biopsy, being cost-efficient along with low morbidity, should be preferred in patients with extremity tumours.

Keywords: Biopsy, Histopathology, Clinic based biopsy, Theatre based biopsy, Tumour. (JPMA 65: S-207 (Suppl. 3); 2015)

Introduction

Tissue diagnosis of a musculoskeletal tumour mass is of paramount importance, as these masses are based on history, laboratory and radiological imaging. Ideally, biopsyis meant to obtain a representative tissue with minimal tumour spread and no interference to future treatment and limb salvage procedures.[1,2] Various techniques, including open surgical biopsy, percutaneous curette biopsy, core biopsy and fine needle aspiration (FNA) have their own specific advantages and caveats.[3] Open biopsy has long been known to be the gold standard for diagnosis of tumours with about 94% to 95% diagnostic accuracy.[4]

FNA is minimally invasive, has low risk of contamination and is low-cost, but limited sample is a caveat. Advantages of curette biopsies are that they are easily done at clinic under local anaesthesia with good diagnostic accuracy and is very cost-effective.[5] Open biopsies performed in operating rooms are done under general anaesthesia and deep tissues, including those which are close to major vessels, can be sampled. Additional advantage is that the sample can be sent to histopathology for frozen sections to confirm the tumour cells in the acquired sample.[6]

The current study was planned to analyse and compare the diagnostic accuracy of percutaneous curette biopsy at clinic and open biopsy in extremity tumours.

Material and Methods

The retrospective study was conducted at Aga Khan University Hospital (AKUH), Karachi, and comprised record of patients who underwent biopsy procedure of extremity tumours from January 2008 to December 2011. Patients were identified from departmental tumour registry and Health Information Management System (HIMS).

All biopsies had been performed by a consultant orthopaedic oncologist. Inclusion criteria for clinic biopsies were adult patients over 18 years of age, cooperative and able to tolerate the procedure under local anaesthesia. Paediatric patients or patients with cognitive impairments or phobic to proceed in clinic under local anaesthesia, deep specimens involving pelvic region or inaccessible mass or tissues close to major vessels were excluded. These biopsies were subsequently conducted in the operating room under general anaesthesia.

For open biopsies, the obtained tissues were sent to histopathology for frozen sections to confirm the

Department of Surgery, Aga Khan University Hospital, Karachi.

Correspondence: Waseem Ahmed. Email: dr.waseemzubair@ymail.com

suspected pathology.

Clinical parameters in terms of age, gender, site and tissue involvement, grade of lesion, and complications were evaluated. Hitopathological reports of clinic as well theatre biopsies were compared with the final histopathological report of resected specimens to identify concordance.

Results

Medical records of 119 patients were located, but 32(27%) had to be excluded owing to insufficient or missing information or because the final procedure had been done elsewhere. The final study sample was 87(73%). Of them, 42(48%) biopsieswere done in theatre and 45(52%) in clinic.

In the theatres, the most common tumour was osteogenic sarcoma in 11(26%) followed by Ewings tumour in 5(12%), Giant cell tumour in 3(7%), while the rest included Synovial sarcoma, malignant fibrous histiocytoma (MFH), chondrosarcoma, lipo-myosarcoma, metastatic tumour etc (Table 1). Biopsy was inconclusive in 1 patient, leaving the diagnostic accuracy to be 97.7%.

Most common tumour in clinic was synovial sarcoma found in 8(18%) followed by osteogenic sarcoma in 6(14%), Ewings tumour in 6(14%), and fibromyxoid sarcoma in 3(6%) patients, while the rest included MFH, chondrosarcoma, lipo-myosarcoma, metastatic tumour etc. Biopsy was inconclusive in 3 patients, leaving the diagnostic accuracy to be 95.5% (Table-2).

Three patients with inconclusive clinic biopsies subsequently underwent re-biopsy in theatre of which histopathological diagnosis of 2 patients could not be established.

Table-1: Patient characteristics.

Demographic variables (n=45)	Biopsy in clinic (n=42)	Biopsy in theatre
Age	29	32±19.6
Gender Male/Female	53/47	60/40
Upper extremity (in %)	27	83
Lower extremity (in %)	73	17
Soft tissue tumour (in %)	69	26
Bone tumour (in %)	31	74
Most common tumour	Synovial sarcoma	Osteosarcoma

Table-2: Diagnostic accuracy as compared to final histopathology.

Diagnostic Yield	Clinic biopsy	Theatre biopsy
	93 %	95%

Complications encountered were surgical site infection (SSI) in 2 patients operated in theatre and 1 patient whose biopsy was performed in clinic which was managed successfully by antibiotics. No other complications were encountered.

Discussion

For a long time, open biopsy has been considered the gold standard for biopsy and tissue diagnosis of musculoskeletal masses. However, recent studies confirm that the yield of biopsy is effective and should replace open biopsy as the method of choice.[7]

Our study has quite comparable results in both biopsy methods with the diagnostic accuracy of 97.7% in theatre biopsies compared to 95.5% in clinic biopsies. We found 2 patients in whose biopsy were done in clinic to be inconclusive. All of them were re-biopsied in the operating room and unfortunately one of them failed to get the tissue diagnosed.[8]

Mesenchymal tumours or sarcomas are difficult to diagnose and need visualising the stromal structure in addition to cellular morphology.[9] Open biopsy has the advantage of sending the specimen for frozen section which makes sure that the representative samples must be taken. Further, as sarcoma enlarge they outgrow their blood supply, leading to area of central necrosis and sampling from these zones can cause inconclusive sampling.[10]

Conclusion

Clinic-based biopsy was accurate and safe with diagnostic accuracy comparable to theatre-based biopsy. Clinic-based biopsy, being cost-efficient along with low morbidity, should be preferred in patients with extremity tumours.

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