ORIGINAL RESEARCH PAPER

Medical Science

Spinal biopsy with core needle and suction technique

KEY WORDS: spinal, tumour, suction technique, Trephine biopsy, core needle

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ABSTRACT

Introduction Various surgical techniques have been described to obtain bone tissue sample to determine the pathological analysis. However the degree of accuracy between various techniques have been variable.
Materials and method We routinely use a core needle biopsy with a suction technique. All patients undergoing vertebral biopsy for histology analysis for known or suspected malignancy was retrospectively analysed. The outcome of histology results have been reported.
Results There was 62 biopsies (in 61 patients) with 58 biopsies being adequate for tissue analysis (93.5%). Histology was reported positive for tumour in 32 biopsies and 26 being non malignant conditions.
Conclusion Core biopsy with suction technique has a good success rate to obtain tissue sample for histological analysis.

Introduction

With advancing surgical and oncology services it is now possible to treat even advance tumour and improve the survival of cancer patients [1]. It has become important to get accurate tissue diagnosis in the management of spinal tumour. However accurate diagnosis is only possible with histology examination hence it has become more important to have an accurate way of obtaining tissue sample. Multiple percutaneous closed and open biopsy of the spine have been reported with good success rate [2,3]. We report our experience using an improvement on core biopsy technique with a suction enabling better way of obtaining tissue sampling.

Technique

Patient is positioned prone with pillows supporting pelvis and shoulders. All biopsies were done transpedicular under general anaesthetic with open technique using a standard midline approach.

We used the method described by Fyfe et al [4]. for bone biopsy through a transpedicular approach for thoracic and lumbar biopsy. Using a C arm intra operative imaging both in AP and lateral was obtained to assess level and depth of the core biopsy needle.

The biopsy needle consist of four parts; 1.5mm stainless steel guide wire, a tapered dilator of 4mm external diameter, trephine guide of 5mm external diameter and a biopsy trephine of 3.5mm internal diameter.

A stab incision is made on the skin and the dilator along with trephine guide introduced at the desired pedicle under xray guidance. The dilator is then swapped for the trephine biopsy with railroading technique. For open biopsy Harlow biopsy trephine is introduced directly on to the desired pedicle (Figure 1). By gently pushing the trephine to the desired depth biopsy is performed (Figure 2).

To extract the specimen a negative pressure is applied to the trephine with a small disposable 20ml syringe applying gentle negative suction. The trephine is rotated to release the specimen and gently withdrawn (Figure 3). The specimen is expelled with the obturator and biopsy to a deeper tissue plane can be made by adjusting the collet (Figure 4).

Results

We has routinely used this technique in the last 10 years and had a successful outcome in obtaining tissue samples (93.5%). We had 62 biopsies in 61 patients (16male and 46female). Tissue sample were adequate for histopathological examination in 58 biopsies for tissue diagnosis but was inadequate in 4. Histology was positive for tumour in 32 biopsies and 26 biopsies had non malignant conditions (Table 1).

Discussion

Percutaneous bone biopsy techniques has been described in the 1930s by Coley et al [5] and Robertson reported on needle biopsy in 1935 [6].

Bone biopsy is a definitive diagnostic procedure in suspected tumour patients enabling to obtain accurate diagnosis by means of histology examination. This helps with further management such as surgical, radiation, hormonal, or chemotherapeutic. Histology may make the difference between managing a potential curable disease or non curable one.

Studies have shown an appropriate sample size is a major determinant for accurate qualitative and quantitative histological diagnosis of bone diseases. It is also important to determine the technique used to obtain the sample itself has minimal trauma to the biopsy sample enabling it to be suitable for histology analysis. Harlow wood trephine has a diameter of 3.5mm which is sufficient to obtain adequate sample. The Harlow Wood vertebral biopsy needle has been designed specifically to provide a large tissue specimen with minimal damage to surrounding soft tissues.

The success rate of any type bone biopsy can be variable between 62 to 100% [7]. Trephine bone biopsies have been reported to have average accuracy rate of 81 per cent [7] and drill bone biopsy to be 80% Griffiths [8]. These findings are compatible with the present figure of accuracy 93.5%.

Fine bone needle aspiration is lesser traumatic to the patient and can be under local anaesthetic. However, it was not found possible to use this technique in hard (sclerotic) lesions and in lesions beneath intact cortical bone. Fine needle aspiration would not have yielded adequate material from the sclerotic lesions and it would have yielded a lower adequacy than trephine biopsy in mixed lesions and compressed vertebrae [9,10].

Tumour tissue can be either solid or soft. With only using a standard core biopsy needle there is a possibility in non solid tumours the complete tissue may not come along with the biopsy needle. The negative suction with the syringe keeps the tissue within the trephine making the successful procedure.

Conclusion

Core biopsy technique with suction technique has a good success rate to obtain tissue sample for histological analysis.

Figure Legend

Figure 1: The Harlow trephine is introduced to the desired level of pedicle with an open technique.

Figure 2: By a gentle push the trephine is advanced further to the desired level of biopsy in the vertebral body under imagine guidance.

Figure 3: The tissue sample is then withdrawn with a twist and using a syringe suction technique. This allows maximum harvest of the tissue.

Figure 4: The tissue is then withdrawn from the trephine with an obturator.

Figure 1

Figure 2

Figure 3

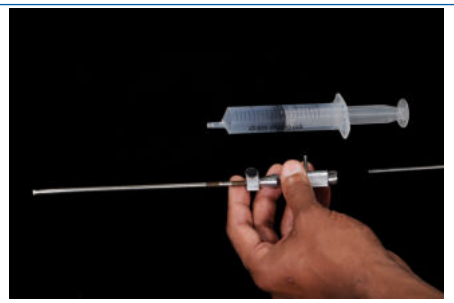

Figure 4

Table 1: Various diagnosis from the biopsy results

Malignant diagnosis	
Breast	4
Renal	4
Gastric tumour	2
Lung	4
Undeferenciated/adenocarcinoma	10
Myeloma	4
Nerve sheath	1
Lymphoma	3
Total	32
Non malignant diagnosis	
Myelofibrosis	2
Pagets	4
Discitis/infection	8
Osteoporosis	2
No evidence of malignancy	10
Unable to assess/no significant cells	4
Total	30

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