

## Original Article

# Comparison of fine needle aspiration with biopsy in the diagnosis of cutaneous leishmaniasis

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**Abstract** *Background* Leishmaniasis is a zoonotic infection caused by the protozoa belonging to the genus *Leishmania*. Demonstration of Leishman-Donovan (LD) bodies on histopathological examination of biopsy specimen is considered to be the definitive diagnostic modality. This study was designed to assess the diagnostic value of fine needle aspiration and to compare it with full thickness biopsy.

*Patients and methods* This was randomized, open label comparison study conducted in department of dermatology, Pakistan Institute of Medical Sciences, Islamabad from 1<sup>st</sup> June 2007 to 31<sup>st</sup> July 2007. 15 patients, 15 years of age or older were enrolled in the study. Selection of patients was made on the basis of clinical features. Patients with the lesions having typical clinical features of cutaneous leishmaniasis-like erythematous crusted plaques or nodules were enrolled. Demographic characteristics including age, sex, residential address, site, size, shape and duration of lesions was noted. Informed consent was taken. Procedure and its pros and cons were explained to the patient. Procedure was performed in the FNA room of pathology department under strict aseptic conditions. Local anaesthesia was not given as patients tolerated the pain well. Biopsy specimen was taken from the same lesion under local anaesthesia after doing FNA. Slides were processed and examined. The diagnosis was confirmed on the basis of finding giant cells or Leishman-Donovan bodies on FNA of the lesion.

*Results* Out of 15 patients 12 patients had positive FNA and three patients had negative FNA report. While the biopsy specimen showed typical histopathological features of cutaneous leishmaniasis in 14 out of 15 patients and one turned out to be a case of ruptured inclusion cyst. So out of 3 negative cases of FNA, one had ruptured inclusion cyst. The diagnostic rate was 80% for FNA and 93.3% for biopsy.

*Conclusion* Fine needle aspiration seems a reasonably good diagnostic modality for cutaneous leishmaniasis. Its sensitivity is comparable to that of full thickness biopsy.

### **Key words**

Cutaneous leishmaniasis, fine needle aspiration, histopathology.

## **Introduction**

Leishmaniasis is caused by protozoal species and subspecies of the genus *Leishmania*.<sup>1</sup> Although no area is immune, the disease is endemic in tropical and subtropical countries.<sup>2</sup>

The World Health Organization (WHO) estimates that there are 400,000 new cases world over each year.<sup>2</sup> Cutaneous leishmaniasis (CL) is endemic in Baluchistan province of Pakistan.<sup>4,5,6</sup> It is one of the major health concerns for the public in general.

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Diagnosis usually is based on the clinical appearance of the lesion. However, to the unwary, there are a number of mimics; leishmaniasis may be underdiagnosed or overdiagnosed and treated unnecessarily. The

treatment is toxic, so pathological confirmation should be sought, preferably by demonstrating the organism in tissue and culture.<sup>7</sup> Unfortunately, this is not always possible in clinical practice. The parasite may not be found by most adequate methods. A full-thickness biopsy is taken from an infiltrated margin of the lesion. Alternative diagnostic techniques are impression smears, culture, needle aspirates, leishmanin skin test and slit-skin smears.<sup>8,9</sup> Out of these histopathological examination of biopsy specimen is considered to be the most reliable test although even this modality has its limitations in certain cases.

In this study we have evaluated the sensitivity of fine needle aspiration (FNA) in the diagnosis of cutaneous leishmaniasis in comparison with the results of biopsy. FNA is a simple procedure in which the patient does not require special preparation before test. Regarding the sensitivity of procedure our study has shown that it is a reasonably good diagnostic modality, and the results are comparable to those of biopsy.

### **Patients and methods**

This open label comparison of FNA and biopsy in the diagnosis of cutaneous leishmaniasis was carried out in dermatology department of Pakistan Institute of Medical Sciences, Islamabad, from 1<sup>st</sup> June 2007 to 31<sup>st</sup> July 2007. Patients were of either sex, aged 15 years or older, mostly belonging to Islamabad and Azad Kashmir. Clinical examination of the lesion and of associated systems was done. They did not have any other significant concomitant disease. They had normal blood counts, liver and renal function tests before starting treatment. Patients who were pregnant or lactating were excluded from the study.

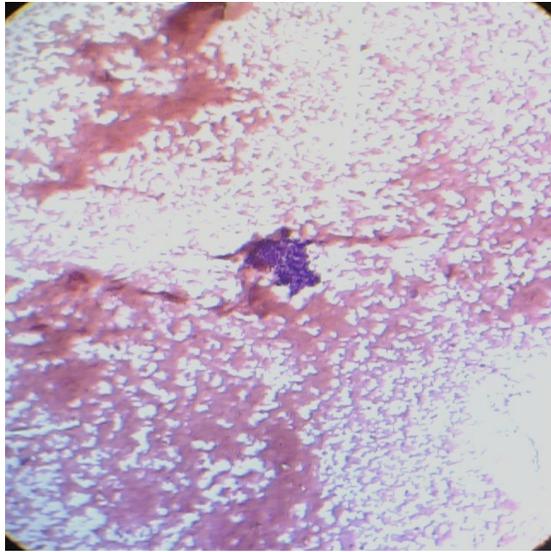
Fifteen patients fulfilling the inclusion criteria were finally enrolled and were registered. Demographic characteristics including age, sex, residential address, site, size, shape and duration of lesions was noted. Informed consent was taken. Procedure and its pros and cons were explained to the patient. Procedure was performed in the FNA room of pathology department under strict aseptic conditions. Local anaesthesia was not given as patients tolerated the pain well. Biopsy specimen was taken from the same lesion under local anaesthesia after doing FNA. Slides were processed and examined in the regularly held dermatopathology conference every week in the department of Pathology. The diagnosis was confirmed on the basis of finding giant cells or Leishman-Donovan (LD) bodies on FNA of the lesion.

Chi-square test was used for categorical variables, while T-test was used to compare duration of lesions (numerical variables) for difference in sensitivity of the test in relation to the duration of lesions.

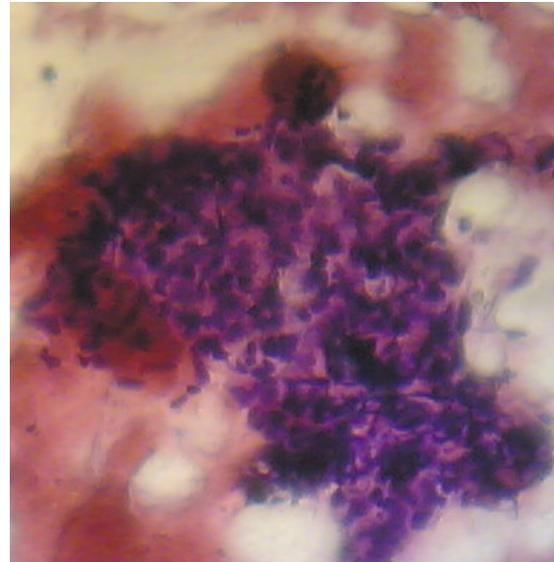
### **Results**

A total of 15 patients were enrolled in the study, which belonged to both sexes and aged over 15 years. There were 10 (66.7%) females and 5 (33.3%) males, showing female predominance. Mean age was  $32.53 \pm 20.93$  years. As far as duration of lesions is concerned 11 (74%) patients had duration of lesion of 2-4 months and 4 (26.6%) patients had duration of less than 2 months.

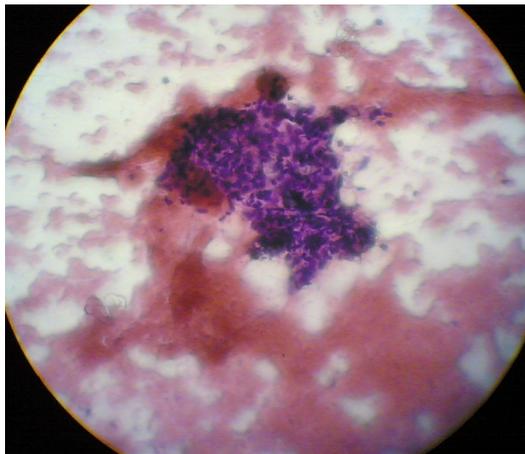
Out of 15 patients 12 (80%) patients had



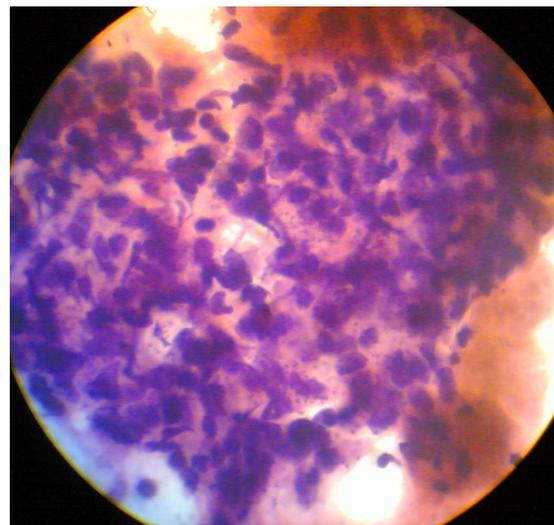
A.



C.



B.



D.

positive FNA and only 3 (20%) patients had negative FNA report (**Figure 1**). While the biopsy specimen showed typical histopathological features of cutaneous leishmaniasis in 14 (93.3%) out of 15 patients and one case turned out to be a case of ruptured inclusion cyst (**Table 1**). So out of 3 (20%) negative cases of FNA, 1 (6.6%) was the case of ruptured inclusion cyst. When the two techniques were compared the difference was not statistically significant with  $p>0.05$ .

**Figure 1 (A-D)** FNA of patient showing giant cell filled with Leishmania-Donovan bodies at different levels of magnification

### Discussion

Since the treatment of CL is toxic, the pathological confirmation should be sought, preferably by demonstrating the organism in tissue and culture. Unfortunately, this is not always possible in clinical practice. The parasite may not be found by the most adequate method i.e. a full-thickness biopsy taken from an

**Table 1** Sensitivity of FNA vs full thickness biopsy in the diagnosis of cutaneous leishmaniasis

	<i>FNA</i> ( <i>n=15</i> )	<i>Biopsy</i> ( <i>n=15</i> )
Positive LD bodies	12 (80%)	14 (93.3%)

FNA = Fine needle aspiration, LD bodies = Leishman-Donovan bodies

infiltrated margin of the lesion. Alternative diagnostic techniques are impression smears, culture, needle aspirates, and slit-skin smears.<sup>10</sup> Regarding new modalities<sup>11</sup> of diagnosis PCR is considered to be most reliable test especially in chronic lesions of CL in which granulomas formation makes the differentiation from lupus vulgaris difficult. Histopathological examination of biopsy specimen is considered to be most reliable test although even this modality has its limitations in certain cases especially in chronic lesions in which granulomas formation makes the lupus vulgaris a strong histopathological differential.

Although biopsy is not a very complicated procedure to perform but still in certain cases like in case of lesions located on cosmetically sensitive sites like face, arms and legs, it is not feasible due to the risk of consequent scarring. And as we know that cutaneous leishmaniasis is mostly found in the same sites being mostly exposed. Additionally biopsy procedure requires special preparation. Also the processing of specimen in laboratory before slides being available for examination is a lengthy process and patient has to wait for about ten days to get the result. Lastly in most of the areas expert pathologists are not available and possibility of getting wrong report is very high. This is especially true for the rural areas of Pakistan. Considering all these problems there is a need for a procedure that is not only simple to perform but also cheaper one and easy to be read and interpreted.

FNA is a diagnostic procedure which can almost remove all the above mentioned problems. In this study we have evaluated the sensitivity of FNA in the diagnosis of CL and have compared it with the results of biopsy. FNA is a simple procedure in which patient does not need to have special preparation before test like local anaesthesia, special posture, aggressive cleaning of the lesion before procedure, although reasonable aseptic measures are required while doing FNA. Also no stitching is required and patient can resume his daily routine shortly after the procedure. There are no chances of post procedure scarring or other cosmetic disability, so it can be done on face and other sensitive sites easily.

Regarding the sensitivity of procedure our study has shown that it is a reasonably good diagnostic modality, and its results are comparable to those of biopsy. Also the slides can be processed readily and can be read easily.

## Conclusion

FNA seems to be a reasonably good diagnostic modality for cutaneous leishmaniasis. The striking advantage of FNA being its simple technique, and acceptance by the patients for no chances of post-procedure cosmetic problem exist due to scarring. Additionally it costs less and result can be made readily available and so early treatment can be started. Lastly, hazards of anesthesia can be avoided. It can be done in far off places where facilities for biopsy are not available or a competent pathologist is not available to read the biopsy slides properly, especially in rural areas of Pakistan.

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