

Research article

Ultrasound guided biopsy: A powerful tool in diagnosing AIDS complications

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Abstract

Objective: To discuss the clinical value of ultrasound interventional biopsy in the diagnosis of AIDS related diseases.

Methods: Ultrasound interventional biopsy was performed on different lesions of organs in 366 cases of AIDS patients in our hospital from June 2012 to May 2015. Histopathological and immunohistochemical studies were conducted for samples of the biopsies.

Results: Total success rate of the biopsies was about 98.4% (360/366) with the failure rate of 1.6% (6/366). The incidence of complications related to the biopsies was about 2.5% (9/366). No medical personnel participated in ultrasound interventional biopsy procedures suffered from infection.

Conclusions: Ultrasound interventional biopsy is safe and convenient to be performed on AIDS patients complicated with various opportunistic infections or carcinomas, with a rather high success rate and few postoperative complications. Ultrasound interventional biopsy has a great clinical significance in early diagnosis of AIDS complications.

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Keywords: AIDS; Interventional ultrasound; Biopsy

1. Introduction

Acquired Immune Deficiency Syndrome (AIDS) can cause cellular immune deficiency, which brings various opportunistic infections and carcinomas [1–3]. According to autopsy, 90% of AIDS patients died from various complications [4]. Therefore, early diagnosis of AIDS-related diseases has great importance to timely treatment. Reports on the usage of Ultrasound interventional biopsy (UIB) in diagnosing AIDS-

related diseases are rarely seen. Here we retrospectively analyzed the application of UIB performed on 366 cases of AIDS patients in our hospital during the past three years.

2. Material and methods

2.1. Materials

Ultrasound interventional biopsy was performed on 366 cases of AIDS patients in the fourth people's hospital of Nanning, from June 2012 to May 2015. 225 cases were male, and 141 cases were female. The age of the patients ranged from 16 to 80. UIB target sites included: 1) 177 cases of superficial organs, including 139 cases of subcutaneous masses, 12 cases of thyroid, 21 cases of mammal glands, and 5 cases of scrotum; 2) 189 cases of thoracic and abdominal organs,

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including 51 cases of lung, 77 cases of liver, 42 cases of kidney, 3 cases of spleen, 7 cases of retroperitoneal masses, and 9 cases of prostate. All their diagnosis was made based on the latest diagnostic criteria for HIV/AIDS of People's Republic of China [5], and confirmed by AIDS laboratory in our hospital.

2.2. Methods

Preoperative preparations included 1) blood routine examination and coagulation examination; 2) informed consent document from patients or their families; and 3) biopsy instruments, including LOGIQ 9 ultrasound instrument, 3.5 MHz convex array probe and 11 MHz linear array probe, needle holder, biopsy gun, 16G biopsy needle, sterile probe protection kits and first-aid supplies, etc.

Biopsies were performed by specialized doctors in our Department of Ultrasound under requirements of clinicians. UIB procedures included the following steps. 1) Routine preoperative ultrasound examination on puncture arrangements, including body position of patients, puncture points and paths. 2) Put biopsy stent, disposable sterile probe protector and guiding groove on ultrasonic probe, meanwhile, the assistants put on sterile gloves and held the ultrasonic probe. 3) The operator put on goggles, mask, operating coat and double gloves; and then sterilized and anesthetized the puncture areas, and performed ultrasound guided biopsy on diseased tissues and organs [6,7]. 4) 2–4 punctures were prepared on each

puncture site; and all samples were immobilized followed by being sent for histopathological and immunohistochemical examinations. 5) Inpatients were sent back to the wards, and outpatients stayed 1 h in hospital for observation about whether adverse reaction occurred. 6) All the used needles, biopsy needles and scalpels, along with the used bed sheets, hole towels, gloves, probe protector and probe guide ducts, were sent for destruction.

Evaluation standard of UIB is that a biopsy would be considered as successful only when accurate pathological diagnoses were made based on its samples.

3. Results

3.1. UIB success rate and failure rate

Total success rate of the biopsies was about 98.4% (360/366), with the failure rate of 1.6% (6/366). As for the failure cases, two cases of lung biopsy were stopped halfway due to nervousness of patients, and little specimen were collect which was not possible to give histological diagnosis; one case of renal biopsy was canceled for the patient could not cooperate; and the other 3 cases were subcutaneous masses, of which the samples were too small to meet the requirements of histological diagnosis. All the six medical personnel participated in UIB were not infected after occupational exposure.

Table 1
Statistics of 216 cases of AIDS patients underwent UIB.

Puncture site	No. of cases	Results of histopathological and immunohistochemical studies	Diagnose accordance rate %
Lung	51	3 cases of cryptococcal pneumonia, 2 of chronic inflammation, 8 of tuberculosis, 5 of lung cancer, 31 of Pulmonary Penicilliosis Marneffei, and 1 of failed to diagnose	54.9(28/51)
Liver	77	23 cases of chronic hepatitis B, 11 of hepatitis C, 7 of coinfection of hepatitis B and hepatitis C, 6 of hepatic Penicillium Marneffei, 4 of purulent inflammation, 8 of fatty liver, 5 of liver cirrhosis, 9 of liver cancer, 4 of large B cell lymphoma	50.6(39/77)
Kidney	42	10 cases of focal segmental glomerulosclerosis, 7 of minor chronic glomerulonephritis, 8 of mesangial proliferative IgA nephropathy, 6 of non-typical membranous nephropathy, 6 of chronic interstitial nephritis, 3 of lupus nephritis, 1 of inflammatory myofibroblastic tumor, and 1 of failed to diagnose	71.4(30/42)
Spleen	3	1 case of infection of Penicillium Marneffei in spleen, and 2 of splenic tuberculosis	33.3(1/3)
Retroperitoneal masses	7	2 cases of poor differentiated squamous cell carcinoma, and 5 of tuberculosis	42.9(3/7)
Prostate	9	4 cases of prostate tuberculosis, 3 of prostatic adenoma, and 2 of prostatic hyperplasia	55.6(5/9)
Subcutaneous masses	139	30 cases of lymphoid tuberculosis, 26 of chronic inflammation, 9 of acute inflammation, 17 of diffuse large B cell lymphoma, 11 of Hodgkin's lymphoma, 15 of Penicilliosis Marneffei, 19 of poor differentiated squamous cell carcinoma with lymph node metastases, 9 of poor differentiated adenocarcinoma, and 3 of failed to diagnose	41.1(57/139)
Thyroid	12	6 cases of nodular goiter, 4 of tuberculosis of thyroid, and 2 of subacute thyroiditis	41.7(5/12)
Mammary gland	21	6 cases of breast adenosis, 4 of mastitis, 4 of breast fibroadenoma, and 7 of breast carcinoma	57.1(12/21)
Scrotum	5	3 cases of tuberculosis of testis and epididymis, and 2 of chronic epididymitis	60(3/5)
Total	366		50(183/366)

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