



Contents lists available at ScienceDirect

Arab Journal of Gastroenterology

journal homepage: www.elsevier.com/locate/ajg

Original article

Blind percutaneous liver biopsy in infants and children: Comparison of safety and efficacy of percussion technique and ultrasound assisted technique

Engy A. Mogahed, Yasmien A. Mansy, Yasmien Al Hawi, Rokaya El-Sayed, Mona El-Raziky, Hanaa El-Karakasy*

Department of Paediatrics, Kasr Alainy Faculty of Medicine, Cairo University, Cairo, Egypt

ARTICLE INFO

Article history:

Received 1 February 2016

Accepted 30 October 2016

Available online xxxx

Keywords:

Children

Liver biopsy

Percussion technique

Ultrasound assisted

ABSTRACT

Background and study aims: Liver biopsy remains the most reliable method to diagnose various hepatic disorders in children. We aimed to assess the technical success and complication rate of ultrasound (US) assisted percutaneous liver biopsy versus transthoracic percussion guided technique in paediatrics. **Patients and methods:** This randomized controlled study included all cases performing liver biopsy at Paediatric Hepatology Unit, Cairo University Paediatric Hospital over 12 months.

Results: Patients were 102 cases; 62 were males, with age range 18 days to 12 years. Fifty seven procedures were done using the percussion guided technique and 45 cases were US assisted. The total number of complicated biopsies was 14 (13.7%), with more serious complications occurring in the percussion group. Complications were more frequent with younger age, lower platelet count, number of passes and occurrence of hypotension.

Conclusion: US assisted percutaneous liver biopsy, although more costly, but may be safer to perform particularly in younger age.

© 2016 Pan-Arab Association of Gastroenterology. Published by Elsevier B.V. All rights reserved.

Introduction

Despite improvements in serological and radiological techniques, liver biopsy remains the most reliable method to diagnose diffuse hepatic disease and hepatic nodules. Liver biopsy is indicated in various clinical settings, to establish a diagnosis, to assess prognosis, and to monitor therapy [1]. The indications for this invasive technique must be weighed against the small, but not negligible, risk of complications [2].

The three major techniques for obtaining liver biopsy are percutaneous, transvenous, and laparoscopic/open biopsy, with either cutting or suction needles. The indications for liver biopsy are shifting as knowledge of aetiologies, non-invasive biomarker alternatives, and treatment options in paediatric liver disease expand [3].

Percutaneous liver biopsy could be done using the percussion-palpation approach, ultrasound (US) assisted or US guided techniques. The percussion-palpation approach is sometimes referred to as the blind approach. In this technique caudal percussion is

helpful in selecting the site for the biopsy over the hemithorax between the anterior and midaxillary lines, until an intercostal space is reached where dullness is maximal at the end of expiration. The intercostal space below this point is used [4]. Blind percutaneous liver biopsy is a safe and effective invasive procedure, provided that the indications, contraindications, and risk factors for complications and failure are considered carefully [5]. Identifying contraindications is important to avoid the major complications associated with the procedure [6].

When US is used in obtaining the liver biopsy, it is done either immediately before the procedure for site marking (US assisted) or throughout the entire procedure (real time or US guided). In US assisted approach, the US is performed immediately before the liver biopsy, where the site for the biopsy is marked. This is usually referred to as the “X marks the spot” technique, in which an optimal site is identified on the skin, and the distance from the skin to any large hepatic vessels or ducts is measured [4].

On the other hand, under real-time US guidance, the liver and biopsy needle are imaged throughout the procedure. This is usually achieved by utilizing an automated biopsy device that can be operated with one hand while the US probe is held with the other hand [7].

* Corresponding author at: 44 Mohei El-Deen Abu El-Ezz Street, Dokki, Cairo 12311, Egypt.

E-mail address: hanaakaraksy@kasralainy.edu.eg (H. El-Karakasy).

Bleeding in the peritoneal cavity and biliary peritonitis following puncture of the gall bladder or large bile duct are the most serious complications of liver biopsy. The most common complications include pain of varying severity and vasovagal reactions. Intrahepatic or subscapular haematomas are also observed in some cases. Other rare complications include pneumothorax, bleeding in the pleural cavity, puncture of adjacent abdominal organs, infection and breaking of the biopsy needle [8,9]. To reduce the risk of complications, image guidance has been advocated [10]. Sonographic guidance is effective in selecting the biopsy site and guiding the needle [11].

The aim of this study was to assess the technical success and complication rate of sonographically assisted percutaneous liver biopsy compared to the transthoracic percussion guided technique in infants and children.

Patients and methods

The present study is a randomized controlled study that included all cases who were scheduled for performing liver biopsy in the Paediatric Hepatology Unit in Cairo University Paediatric Hospital from the beginning of January 2013 to the end of June 2013. The study protocol was approved by the institutional review board. All patients were enrolled in the study after an informed consent was obtained from parent/guardian. All were paediatric patients, below 18 years of age, of both sexes, having an indication for liver biopsy, with normal coagulation profile (prothrombin time within 3 s from control), platelet count above 80,000/mm³ and haemoglobin level above 7 g/dl. Patients with focal hepatic lesions, respiratory distress and moderate to severe ascites were excluded. Only patients with sufficient pre- and post-procedural clinical and radiological data were included.

All patients were randomly divided into 2 groups using research randomizer program (<http://www.randomizer.org/form.htm>); a group that underwent a transthoracic percussion guided technique for obtaining liver biopsy while the second group underwent an US assisted biopsy. Based upon previous data in our centre; randomization was done for 150 patients which is the maximum expected number of liver biopsies to be performed over a 6-month period.

All patients were subjected to full history taking, detailed general and local abdominal examination. Anthropometric measurements were plotted on Egyptian growth curves [12].

Pre-procedure investigations included a complete blood count, prothrombin time, concentration and INR within a maximum of 7 days pre-biopsy.

Abdominal ultrasonography was done using FFsonic UF-4100 apparatus with abdominal convex linear probe 3.5 MHz to identify liver size, echogenicity, presence of focal lesions, portal and hepatic veins, gall bladder, splenic size, other abdominal organs especially the kidneys and presence of ascites. It was used to mark the proper site of needle entry in the US assisted group.

Parents were carefully informed about the procedure of liver biopsy including risks, benefits and limitations and signed a written consent. The patients were fasted for an average of six hours for solid food, four hours for breast feeding and 2 h for clear fluids.

Pre-biopsy procedure

1. Based upon randomization, the group that was scheduled to perform liver biopsy using the percussion guided approach, caudal percussion over the right hemithorax was done midway between the anterior and midaxillary lines until an intercostal space with maximal dullness was reached. The intercostal space below this one was used for needle entry.

2. In the US assisted group; prior to performing the liver biopsy, the same steps done for the percussion guided technique were followed. In addition; the proper site for needle entry was confirmed by US to be away from the gall bladder, the lung, kidney and large vessels, otherwise the site for needle entry was changed accordingly to a more appropriate intercostal space. The proper site was marked on the skin by a marker.
3. Basal vital signs and oxygen saturation were measured and normal values for heart rate [13], blood pressure [14,15], respiratory rate [16] and O₂ saturation [17] were determined according to the norms for age.
4. Intravenous access was secured.
5. Paracetamol was administered to all patients orally or rectally in a dose of 10–15 mg/kg half an hour prior to the procedure.
6. Oxygen was supplied to the patients via nasal prongs during the whole procedure.
7. Sedation: Patients aged one year or less were sedated using intravenous midazolam in a dose of 0.05–0.1 mg/kg; while patients older than 1 year were sedated using intravenous ketamine in a dose of 1 mg/kg. A second dose of sedative drug was given if there was failure of sedation after 10–15 min.

Biopsy

1. Patients were lying in the supine position with the patient's right hand positioned behind the head.
2. Sterilization of the site of entry was done using povidone-iodine and alcohol.
3. Biopsy was performed with suction technique using core aspiration needle, Menghini needle (secure cut biopsy needle 16–17G, HS Hospital Service S.p.A. Via A. Vacchi 23/25 Aprilia [LT], Italy). G17 was used in neonates, while G16 was used in older age groups. In case of failure of retrieval or withdrawal of small sample (less than 5 mm), a second trial was done to obtain adequate tissue sample in the same sitting. If the second trial failed, biopsy was repeated in another day. The total length of time required to pass the biopsy needle into and then remove it from the liver was usually 2–3 s.
4. The specimen was placed in a 10% formaldehyde solution and sent to the histopathologist. The final assessment of procedure success and obtaining a representative sample was based on the opinion of the pathologist.

Post-procedure

1. Post procedure observation was continued for 6 h. Assessment of vital signs (heart rate, respiratory rate, blood pressure, temperature and oxygen saturation) was performed 30 min, 60 min, 90 min, 2 h, 3 h, 4 h and 6 h post-procedure.
2. The patient was instructed to rest on right lateral position during the 1st hour post procedure. Feeding and activity were advanced as tolerated at least one hour post procedure regarding that the patient is fully conscious.
3. For patients who developed fever or persistent pain during observation, a 2nd dose of paracetamol was administered. Pain was assessed subjectively in patients who could express themselves.
4. Haemoglobin level was drawn 5 h post procedure. Packed red blood cells ± fresh frozen plasma transfusion was given to patients whose haemoglobin level dropped more than 2 g/dl and was associated with hypotension.
5. Abdominal ultrasound was performed 6 h post procedure for screening for the presence of haematoma or intraperitoneal collection.

Download English Version:

<https://daneshyari.com/en/article/8724659>

Download Persian Version:

<https://daneshyari.com/article/8724659>

[Daneshyari.com](https://daneshyari.com)