Endoluminal Forceps Biopsy of the Urotract Disease Through a Percutaneous Nephrostomy Tract

CHIEN-CHUNG TSAI1,3 HUA-TZU HUANG2 SHU-JEN HAN1 LEIN-RAY MO1

Departments of Radiology1 and Internal Medicine4, Tainan Municipal Hospital
Department of Radiology2, Show Chwan Memorial Hospital
Department of Radiology3, Tian-Sheng Memorial Hospital

Articles of sonography or CT-guided percutaneous needle biopsy of the different renal parenchymal disease have been published in the literatures. However, tissue confirmation of the urotract lesion is difficult to be obtained by the percutaneous approach because most of the lesions are small and no definite mass could be demonstrated on imaging studies. Percutaneous nephrostomy is a standard procedure in cases of obstructive uropathy in order to alleviate the obstruction, most of which are secondary to calculi. In some equivocal cases in which the cause of obstruction cannot be definitely determined and a tumor is highly suspected, histopathologic diagnosis is essential for proper therapeutic planning. To obtain a definite tissue diagnosis, we performed transluminal forceps biopsy through a percutaneous nephrostomy tract in nine patients with obstructive uropathy.

Key words: Biopsy; Ureter, neoplasm; Ureter, stenosis or obstruction

Sonography or CT-guided percutaneous needle biopsy is now an established diagnostic procedure in the different renal parenchymal diseases [1-4]. However, histopathologic confirmation of the introurotract lesion is difficult to be obtained. This report evaluates the technical feasibility and sensitivity of endoluminal forceps biopsy of the urotract disease through a percutaneous nephrostomy tract.

MATERIAL AND METHODS

We performed eight percutaneous intraluminal forceps biopsies in eight patients with obstructive uropathy. Patient population included 4 males and 4 females aging 46-78 years old (mean 62 year-old). All patients presented with obstructive uropathy with no evidence of urotract stone in pyelogram (IVU, antegrade and retrograde pyelography), ultrasound and CT scan studies. Pyelogram revealed the level of obstruction in the proximal third of the ureter in four patients, middle third in three patients, and distal third in the remaining one patient. Urine cytology revealed no evidence of malignancy in all cases.

Percutaneous nephrostomy (PCN) was performed with local anesthesia under ultrasound-guided puncture and an 8-French pigtail drainage catheter was inserted using a Seldinger method under fluoroscopic monitoring. In all cases, biopsy was performed with a two-stage method. We initially drained the obstructed urotract until the dilated ureteral decreased in diameter and became less tortuous in about 7-24 days after PCN.

Antegrade pyelogram was done prior to biopsy in order to demonstrate the exact location of the obstruction (Fig. 1a). Passage of the obstruction was done using a 7-French pre-shaped polyethylene catheter together with a plastic coated hydrophilic guidewire (Terumo, Tokyo, Japan). After successful catheterization, the guidewire was placed beyond the lesion and
the catheter was then replaced by a long (30 cm) 9-
French introducer sheath (Cook, Inc., Bloomington,
IN) with its tip positioned at the stenotic area. The
sheath dilator was removed and replaced with a biopsy
forceps (FB-21SX, fenestrated ellipsoid, Olympus,
Tokyo, Japan) (fig. 1b). The sheath must be fixed
when the biopsy forceps is applied against the stricture
to avoid backward dislodgment. Two to four biopsy
specimens were taken and were fixed with formalin
for histopathologic examination. If the stricture cannot
be crossed with the guidewire, the sheath was
advanced to the stenotic area, and biopsy sampling
was done at this region. After each biopsy, the PCN
catheter was replaced in all patients.

RESULTS

Biopsy was technically successful in all patients.
Adequate samples for histological diagnosis were
obtained in 8 of 8 procedures (sensitivity rate 100%),
which included transitional cell carcinoma (n = 4),
tuberculosis (n = 2) (fig. 2a and b), abscess (n = 1) and
chronic inflammation (n = 1). Pain during specimen
sampling was noted in each patient, while transient
hematuria was seen in 5 patients that resolved sponta-
neously. No hemorrhage required blood transfusion.
There were no other major complications such as per-
foration or urine leakage.

Subsequent balloon dilation followed by double J
catheter insertion was performed in two cases of tuber-
culos is, to whom anti-TB drugs were given. Two cases
of transitional cell carcinoma underwent surgical inter-
vention while the other two patients of transitional cell
carcinoma were considered unoperable. Three patients
with benign infections were treated medically.

DISCUSSION

Urotract strictures could either be benign or
malignant, and often their causes could barely be dif-
erentiated from each other by imaging studies only. In
cases of renal parenchyma tumor, percutaneous biopsy
by either ultrasound or CT-guided has been published
in literatures [1-4]. Nevertheless, to the best of our
knowledge, endoluminal urotract forceps biopsy has
not been reported. This report evaluates the technical
feasibility and sensitivity of the transluminal forceps
biopsy of urotract diseases.

Figure 1. a. Antegrade pyelogram shows an intraluminal filling defect at the proximal third of the ureter (arrows) that
yields a histologic diagnosis of transitional cell carcinoma. b. A forceps (arrows) exiting through the tip of the sheath
and the guidewire is placed beyond the lesion.
Percutaneous nephrostomy (PCN) is a prerequisite procedure in performing the transluminal forceps biopsy. The majority of these patients presented with obstruction will undergo palliative drainage. We therefore take advantage of this tract to perform biopsy.

Biopsy is performed under fluoroscopy after the site of the lesion is demonstrated through a pyelogram as a filling defect or a narrowing. This presumably has the greatest chance of yielding abnormal tissues, even when no mass is seen in both the ultrasound or CT scan studies. The forceps is passed through the introducer sheath in order to prevent ureteral injury or perforation. We observed transient hematuria in 5 patients, but no major complication was encountered.

We prefer to perform the biopsy procedure by a stage method in which we initially drain the obstructive tract to alleviate the infection and passage beyond the obstruction would be easier in the less dilated and tortuous ureter. The puncture site of the PCN is also a potential factor for successful cannulation of the obstruction. We prefer middle calyx puncture for easy entry towards the ureter. We use a 9-French introducer sheath to accommodate both the forceps biopsy and the safety guidewire, in order not to lose the tract after the procedure for the future intervention. The use of the introducer sheath with radiopaque marker is of great importance for better localization.

In conclusion, we have found that percutaneous transluminal forceps biopsy is a simple, safe technique with a sensitivity rate of 100%.

REFERENCES


Figure 2. a. Antegrade pyelogram demonstrates marked caliectasis with irregularly narrowed right ureteropelvic junction and the right ureter, which is histologically diagnosed as tuberculosis. b. The tip of the sheath with a radiopaque marker (arrows) locates at the right ureteropelvic junction while the biopsy forceps (arrow heads) is exiting the tip of the sheath.
泌尿道疾病經由表皮腎造口術以鑷子取得內皮的活體切片

蔡建中¹²³ 黃華恩² 韓淑珍¹ 牟聯瑞¹

台南市立醫院 放射科¹ 內科⁴
彰化秀傳紀念醫院 放射科²
東港安泰醫院 放射科³

針對不同腎臟實質的疾病以超音波或電腦斷層導引做細針活體切片的文章，已經有發表在文獻中。不過，泌尿道疾病是難經由經皮穿刺切片獲得病理診斷。因為大部分的病灶都很小，甚至在影像上看不到腫塊。經皮腎造口術是一種阻塞性泌尿道疾病解除阻塞的標準的處置方法，其中大部分是因結石造成。在一些有爭議的病例，他們阻塞的原因無法很確定，而且強烈地懷疑是腫瘤造成，因此組織病理診斷成為是一個必要性，以便做為適當的治療規劃。為了獲得正確的組織診斷，八個有阻塞性泌尿道疾病的病人，我們使用經由經皮腎造口術在內管以鑷子取得活體切片。

關鍵詞：活體切片；介入性檢查；腫瘤；輸尿管狹窄或阻塞