



ORIGINAL ARTICLE / *Pediatric imaging*

# Percutaneous nephrostomy placement in infants and young children

J.Y. Hwang<sup>a,b</sup>, J.H. Shin<sup>b,\*</sup>, Y.J. Lee<sup>c</sup>, H.M. Yoon<sup>b</sup>,  
Y.A. Cho<sup>b</sup>, K.S. Kim<sup>d</sup>

<sup>a</sup> Department of Radiology, Research Institute for Convergence of Biomedical Science and Technology, Pusan National University Yangsan Hospital, Yangsan, Gyeongsangnam-do, Republic of Korea

<sup>b</sup> Department of Radiology and Research Institute of Radiology, Asan Medical Center, University of Ulsan College of Medicine, 88, Olympic-ro 43-gil, Songpa-gu, 05505 Seoul, Republic of Korea

<sup>c</sup> Department of Pediatrics, Pusan National University Children's Hospital, Yangsan, Gyeongsangnam-do, Republic of Korea

<sup>d</sup> Department of Urology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea

## KEYWORDS

Child;  
Infant;  
Hydronephrosis;  
Nephrostomy;  
Percutaneous;  
Urinary Diversion

## Abstract

**Purpose:** The purpose of this study was to evaluate the feasibility, safety, and clinical effectiveness of ultrasound and fluoroscopy-guided percutaneous nephrostomy (PCN) placement in infants and young children.

**Materials and methods:** Between January 2000 and December 2015, 57 patients had a total of 66 fluoroscopically guided PCN placement procedures. There were 37 boys and 20 girls with a mean age  $8.6 \pm 15.3$  (SD) months (range: 1 day–75.5 months). The most common underlying disease was upper-urinary-tract obstruction, including ureteropelvic-junction stenosis (27/66, 40.9%) and ureterovesical-junction stenosis (16/66, 24.2%). Technical success, complications, clinical effectiveness, and radiation exposure were retrospectively analyzed. Technical success was defined as completion of PCN catheter in the renal calyx or proximal ureter. Complications were graded in severity using the Common Terminology Criteria for Adverse Event (version 4.03). Clinical effectiveness was evaluated with presence of decompression of the hydronephrosis on follow-up ultrasonography.

**Results:** All PCN placement procedures were technically successful. A total of 37 complications were identified in 33/37 procedures (89.2%), with transient gross hematuria ( $n=28$ ) being most common (mean hematuria duration  $2.2 \pm 1.4$  [range: 1–6] days), which were grade 1. Postprocedural fever occurred after eight procedures; four and three patients were graded 1 and 2, respectively. Complete hydronephrosis decompression was achieved in 35/53 kidneys (66%), incomplete hydronephrosis decompression in 17/55 kidneys (32.1%), and progression of hydronephrosis was noted in 1/55 kidney (1.9%). Dose-area-product (DAP) was  $44.86 \pm 89$  (SD) (range: 3.7–464)  $\mu\text{Gy cm}^2$  and cumulative dose was  $10.3 \pm 20.4$  (SD) (range: 0.3–97.9) mGy.

\* Corresponding author.

E-mail address: [jhshin@amc.seoul.kr](mailto:jhshin@amc.seoul.kr) (J.H. Shin).

**Conclusion:** PCN is a feasible and effective treatment option to relieve urinary obstruction, and can serve as a bridging procedure until definitive corrective surgery in pediatric patients.  
© 2017 Editions françaises de radiologie. Published by Elsevier Masson SAS. All rights reserved.

Percutaneous nephrostomy (PCN) is performed to establish urinary drainage. Indications for PCN placement are relief of urinary obstruction, urinary diversion, creating an access route for an endourological procedure and diagnostic testing [1]. The most common indication for PCN placement in both adult and pediatric populations is urinary obstruction [2–4].

In pediatric patients, PCN is used as a temporary drain for urinary obstruction, and serves as a bridging procedure until definitive corrective surgery [5]. Definitive corrective surgery to relieve obstruction is essential in the treatment of urinary-tract obstruction in infants and young children, because most urinary obstructions are caused by an anatomic abnormality. Although there are differences in opinion regarding the optimal time for surgical correction, temporary PCN placement is useful to preserve renal parenchyma, minimize deterioration of the renal function, or control infection and sepsis until corrective surgery [2,6–9].

Several studies have reported the feasibility and efficacy of PCN placement in pediatric patients [7,8,10–14], including infants. However, few reports have described the results of PCN placement in infants and young children.

The purpose of this study was to evaluate the feasibility, safety, and clinical effectiveness of ultrasound and fluoroscopy-guided PCN placement in infants and young children.

## Materials and Methods

### Patients

This retrospective study was approved by our Institutional Review Board, which waived the requirement for informed consent.

Between January 2000 and December 2015, 66 fluoroscopically guided PCN placements were performed in 57 patients. There were 37 boys and 20 girls with a mean age  $8.6 \pm 15.3$  (SD) months (range: 1 day–75.5 months). In total, PCN placements were performed unilaterally in 62 patients and bilaterally in four patients, so that the analysis involved a total of 70 kidney.

The underlying diseases in the included patients and clinical indications for PCN placement are reported in Tables 1 and 2. The most common underlying disease was upper-urinary-tract obstruction, including ureteropelvic-junction stenosis (27/66, 40.9%) and ureterovesical-junction stenosis (16/66, 24.2%). Indications for PCN placement were temporary placement with planned subsequent

**Table 1** Underlying diseases in 57 pediatric patients who had a total of 66 fluoroscopically guided percutaneous nephrostomy placements.

| Underlying disease                            | Patients n (%) |
|---|----------------|
| Upper-urinary-tract obstruction               |                |
| Ureteropelvic-junction stenosis               | 27/57 (47.4)   |
| Ureterovesical-junction stenosis              | 16/57 (28.1)   |
| Severe vesicoureteral reflux                  | 5/57 (8.8)     |
| Posterior urethral valve syndrome             | 3/57 (5.2)     |
| Extrinsic compression by a tumor <sup>a</sup> | 3/57 (5.2)     |
| Renal stone                                   | 2/57 (3.5)     |
| Foreign body                                  | 1/57 (1.8)     |
| Total   | 57/57 (100)    |

<sup>a</sup> Neuroblastoma in two patients and yolk sac tumor in one patient.

**Table 2** Indications for 66 percutaneous nephrostomy placements in 57 pediatric patients.

| Indications                               | Procedures n (%) |
|---|------------------|
| Temporary placement                       |                  |
| Upper-urinary-tract obstruction           | 41/66 (62.1)     |
| Severe vesicoureteral reflux              | 2/66 (3)         |
| Posterior-urethral-valve syndrome         | 1/66 (1.5)       |
| Primary decompression                     |                  |
| Upper-urinary-tract obstruction           | 4/66 (6)         |
| Extrinsic compression                     | 5/66 (7.7)       |
| Postoperative stenosis                    | 5/66 (7.7)       |
| Severe vesicoureteral reflux              | 3/66 (4.5)       |
| Posterior-urethral-valve syndrome         | 2/66 (3)         |
| Access route for endourological procedure | 3/66 (4.5)       |
| Total                                     | 66/66 (100)      |

Results are given on a per procedure basis.

corrective surgery ( $n=44/66$ , 66.7%) and primary decompression of the urinary obstruction without planned corrective surgery ( $n=19/66$ , 28.8%). Three patients underwent PCN placement to establish access routes for removal of a stone (2 patients) or a foreign body (1

Download English Version:

<https://daneshyari.com/en/article/8606319>

Download Persian Version:

<https://daneshyari.com/article/8606319>

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