RESEARCH ARTICLE

Inferior Vena Cava Catheterization for Exhausted Hemodialysis Access Patients in the Medical City, Baghdad, Iraq (Single center Two years' Experience)

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ABSTRACT

Background: Progress number and long period survival of chronic renal failure patients needing dialysis have presented a new difficulty associated with a vascular entree and its problems.

Aim: The study aims to show the effectiveness and safety of the surgically placed heamodylisis catheter in the inferior vena cava (IVC) in-patient with exhausted access.

Patients and Methods: A prospective study for two years from (1 January 2014 – 31 December 2015), including 50 patients (35 males and 15 females). All patients with end-stage renal disease had exhausted access—surgical catheterization of IVC through Rt. Lumber incision using cuffed long double lumen catheter, pediatric type catheter was used in pediatric age group. The procedure was done under general anesthesia in twenty-one (21) Patients, while in the other 29 patients were done under spinal anesthesia.

Results: First 6 months' patency rate was 98%, while the 1-year patency rate was 44%. Complications rate was seen in 4% of patients, and the mortality rate was 2%.

Conclusion: Operating IVC catheterization is a harmless and well-organized technique with little morbidity and mortality rates.

Keywords: Catheter, Hemodialysis, IVC, Renal.

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INTRODUCTION

The technique of inferior vena cava (IVC) catheterization or Trans lumbar tunneled dialysis catheter (TLDC) was originally described by Kenney *et al*.[1] IVC catheter was offered when all other HD accesses had failed.[1,2] Arterio-venous fistula or central venous catheterization transports energetic significance for hemodialysis, a vital management choice in chronic renal failure patients. In terminal entree difficulties, where entirely probable vascular entree answers appear to be tired and the patient life endangered, every work should be completed to designate the patient's arterio-venous anatomy and select a suitable vascular entree place. Numerous suggestions have been defined regarding upper extremities and central veins.[3,4] Central venous obstacle of the upper extremity is a common difficult in patients on longstanding dialysis treatment; some of them had tired all the appropriate vessels, including those from the lower extremities; due to prior catheterization, arteriovenous fistula or graft assignment. These are measured as a test for both the nephrologist as well as surgeons in the exploration for new choices. Catheterization of the inferior vena cava or the heart may be performed. The study aims to show the effectiveness and safety of the surgically placed heamodylisis catheter in the inferior vena cava in-patient with exhausted access.

PATIENTS AND METHODS

A prospective study from (1 January 2014 – 31 December 2015), a total of 52 procedures were performed in (50) patients. The indication for the procedure was the unavailability of conventional vascular access in patients with end-stage renal disease. The patients were referred from different dialysis centers because of exhausted access. Preparations for surgery were done, including complete blood pictures, blood sugar, blood urea, and serum creatinine, chest x-ray, ECG, Doppler study of upper and lower limbs venous system, abdominal ultrasound, and Doppler study of IVC also was done. A dual lumen Inferior Vena Cava catheter set was inserted using an open surgical approach. The IVC was approached through

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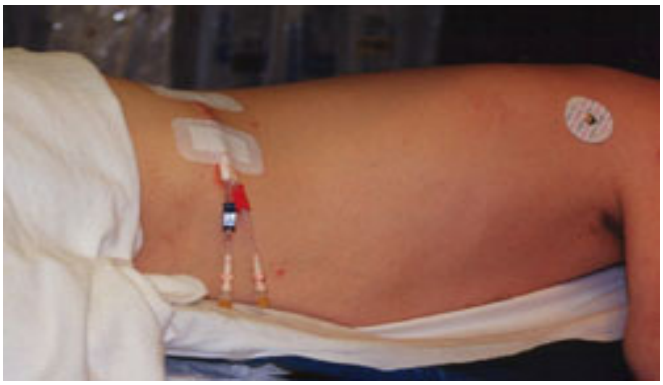

Figure 1: Position of IVC catheter after fixation.

Figure 2: X-ray shows of IVC catheter

a right lumber incision (between the costal margin and iliac crest) (Figure 1). A long dual lumen catheter (27–28 cm) was selected for open placement directly into the IVC, anchored to the psoas muscle, then tunneled subcutaneously at the anterior axillary line. Pediatric size dual lumen catheter was used for the pediatric age group. The procedure was done under general anesthesia in 21 patients, while in the other 29 patients done under spinal anesthesia.

RESULTS

- Fifty patients were involved in this study, 30 (60%) were males, and 20 (40%) were females. The mean age was 57 years ± 7.4 SD.
- All the patients included in the study were followed up for a period of one year.
- First six months patency rate was 98%, while 1-year patency rate was 44%.
- Early complications were seen in 1 (2%) of a patient; he developed hematoma collection at the surgery site, which was treated conservatively.
- Late complications after one month were seen in 9 patients:
  - ◊ Five 5 developed malfunctioning catheters due to thrombosis; two of them were managed by the wiring of the catheter and irrigation with heparinized saline with the restoration of function, while the other three patients were treated by replacement catheter using replacement Sildenger's technique under local anesthesia.
  - ◊ Catheter tract infection developed in 3 patients and was treated conservatively with preservation of function
  - ◊ One patient had slipped a catheter without replacement.
- The mortality rate was 2%, whereas one patient developed severe intraoperative hypotension and pulmonary edema and died on the second postoperative day in the intensive care unit.

DISCUSSION

Surgical catheterization of inferior vena cava with long dual lumen catheter helps prolong patients' lives with exhausted vascular access. We did operating IVC catheterization and afforded functioning vascular entrees to patients on the first postoperative day (Figure 2). Surgical catheterization of IVC is rarely reported in literature.[7] Short-term patency was 98%, and this is comparable to most of the other studies.[6-8] while operative complications were rare in different series all over the world, in our study it occurred at minimum frequency but still, more than previously recorded.[8] Complications of IVC catheters and other long-term hemodialysis catheters include infection and thrombosis.[6,7] In our series, infection occurred in three patients (6%) who were treated conservatively. The infection rate was higher than other studies,[4,6,9] and this may be attributed to aseptic nursing care and poor patient hygienic care. Thrombosis during the first 6 months occurred in eight patients (16%), three of them had successful replacement of the catheters, while the other five patients were treated by wiring and irrigation with regain of catheter function. During the first 6 months, the patency rate was higher than other studies,[1,5,8] while the 1-year patency rate was equivalent to other studies.[4,6] No significant retroperitoneal hematoma or catheter migration occurred.

Ineffective blood flow was lower than other studies,[2,8], and this is due to direct vision cannulation and securing the catheter to the IVC after manipulation and testing of function. One patient had slipped his catheter without replacement. Mortality occurred in one patient due to medical causes unrelated to the procedure.

CONCLUSION AND RECOMMENDATIONS

- We can conclude that; surgical catheterization of IVC is a harmless and well-organized technique with little death rate and morbidity.
- Replacement of IVC catheter be done safely using Sildenger's technique.

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