To Find Role of Routine Chest X Ray in Case of Supracostal PCNL: Can Complains and Physical Examination Replace it

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ABSTRACT

Percutaneous nephrolithotomy (PCNL) is very common procedure carried out in today’s urological practice. Many of times supracostal approach is taken which can be cause of no. of complication. Routinely chest x ray is done after supracostal PCNL to detect any complication. We retrospectively studied whether this chest x ray is required or not. We retrospectively studied 347 PCNL carried out in our institute out of which 102 has supracostal approach. Symptoms and complains of patients were recorded in progress reports of patients. Chest x ray were also submitted with case files. These are studied again to find correlation between symptoms and chest x rays findings. All of 102 patients with supracostal approach underwent check chest x-rays in evening of surgery. Symptoms of patients also recorded. Seven patients had symptoms related to chest in form of difficulty in respiration, 3 patients complain of pain in lower chest, 5 patients have increased respiratory rate. Out of all 102 x rays only 2 patients have findings. one of them had hydro-pneumothorax and other one with pleural effusion. Both patients were managed well one with chest tube and other conservatively. Symptoms were correlating with chest x rays findings. It is not necessary to do routine chest x ray after supra costal PCNL rather investigating only symptomatic patients would be more rational approach.

KEYWORDS
Supracostal PCNL, Percutaneous nephrolithotomy Chest x ray.

Introduction

Percutaneous nephrolithotomy (PCNL) is the treatment of choice for stag horn stones, large renal stones and stones not responding to ESWL treatment. (Segura, 1989) The success of PCNL depends on accurate placement of percutaneous tract that provides direct and easy access to the stone. Posterior superior puncture is ideal for large stag horn, upper calyceal and upper ureteric stones (Wolf et al., 1997; Golijanin et al., 1998). Inferior calyceal stones are easily approached through a lower approach from lower calyx. Sometimes a higher supracostal approach is required to access in PCNL more so in superior calyceal and sometimes in middle calyceal stones. This supracostal approach is sometimes through the pleura and can cause complications.

Standard technique of PCNL through intercostal approach has been described for stones at specific places and chest x ray is
routinely done to detect any complication. This chest x ray is not without any controversies. It causes radiation hazard and increased health cost. We retrospectively studied the PCNL operated patients hereby to find the role of routine chest x-ray in supracostal PCNL.

Materials and Methods

Between January 2007 and February 2015, 347 patients underwent PCNL at our institute Pt. BDS PGIMS, Rohtak in department of urology. Out of these cases, 102 patients undergone supra-costal approach with fifty four patients on right side and forty eight on left side. A total of 167 patients were operated on right side and 178 on left side. In 23 patients three puncture were made and in 31 patients two puncture were made for complete stone clearance. Out of 102 patients in which supracostal approach was used, details of stone type given in table 1. Out of these 102 patients, in 10 patients three punctures were made and in 11 two punctures were made. The site of puncture was according to surgeon's preference and not randomly allocated. In supracostal approach needle is passed through the middle of the intercostal space to avoid laceration of the intercostal vessels and nerve above and minimum irritation of the periosteum of the rib below. All punctures were done between 11-12th intercostal space under C-arm guidance. After this guide wire is introduced and tract is dilated to 10F. This tract is further dilated to 28F using telescopic dilators. Now 28 F sheath made of teflon is placed through this tract. Through procedure was completed using 26 F nephroscope and fragmenting stone with pneumatic lithoclast. At the end of the procedure a 20F nephrostomy tube was placed through the tract. In all patients with supracostal approach check chest x-rays was done in evening of surgery to detect complications. Symptoms of patients were recorded. This whole data is compiled later on and analyzed statistically.

Results and Discussion

All of 102 patients with supracostal approach undergone check chest x-rays in evening of surgery. Symptoms of patients also recorded. Seven patients had symptoms related to chest in form of difficulty in respiration, 3 patients complain of pain in lower chest, 5 patients have increased respiratory rate. Out of all 102 x rays only 2 patients have findings. One of them had hydro-pneumothorax and other one with pleural effusion. Both patients were managed well one with chest tube and other conservatively. Chest tube was removed after 24 hours. There was no other post chest tube complication. These 2 patients had complained of respiratory difficulty, pain in lower chest and tachypnoea.

Other complications were tachycardia, pain at tube site, bleeding, hematuria, fever.

Supra-costal approach is preferred approach for large stag horn calculi, upper calyceal and upper ureteric stones. Many of times this upper calyx lies and sometimes middle calyx lies at supra costal position. So urologist has to puncture through the intercostal space. Major problem with intercostal approach is pleural breach and its complications. Complications have been described like hydrothorax, haemothorax, pneumothorax haemo-pneumothorax, hydro-pneumothorax, lung contusion, liver and spleen injuries etc., (Picus et al., 1986; Hopper et al., 1990)

To detect all these complication standard chest xray post operatively is done to in all these patients. But this chest x ray is not with out any controversies. This is well recognized not all pleural effusions can be detected by x-ray. Mobilizing patient for purpose of x
Ray is associated with difficulties in mobilizing patient, x-ray machines and staff. This x-ray causes radiation hazard and extra cost to patient. This leads to increasing healthcosts and inconvenience is caused. Now we tried to find whether it is necessary to do routine chest x-ray in these patients.

Chest complications of intercostal approach were higher in the study of Hossain et al at about 13.5% with 4 out of 28 having chest tube insertion. (Hossain) In the study of Yadav et al 11 out of 332 patients has pleural breach and 7 patients chest tube was put (Yadav et al., 2006). Our study is comparative to it with lesser complication rate. Muzrakchi et al in 2004 found that PCNL is safe procedure when done through intercostal approach and noticed only two complications in 57 procedures (Ahmed et al., 2004). Lang et al in their study also noted safety of PCNL with intercostals approach (Lang). Gupta et al in their study recommended routine chest x-ray after supracostal PCNL but they did not taken symptoms of patients in account (Gupta et al., 2002). Kekre et al in their study had higher complication rate of 10% and ICD was put in many patients. But in our study complication rate is low and patient can be managed symptomatically. (Kekre et al., 2001)

Bjurlin et al in his study of 214 patients with 21% intercostals access found chest x-ray routinely as unnecessary practice. Low complication rates of procedure along with symptomatology can displace routine chest x-ray. (Bjurlin et al., 2011) Ogan et al in his study found that intraoperative fluoroscopy and symptoms directed imaging can replace routine imaging. (Ogan et al., 2003)

Table 1 Distribution of stone types in case of supracostal PCNL

| Type of Stone       | No. of Patients |
|--------------------|-----------------|
| Staghorn calculus  | 21              |
| Superior calyceal stone | 48            |
| Upper ureteric     | 14              |
| Pelvic             | 19              |

In our study out of 102 patients, seven patients had symptoms related to chest in form of difficulty in respiration, 3 patients complain of pain in lower chest, 5 patients have increased respiratory rate. Out of all 102 x rays only 2 patients have findings. One of them had hydropneumothorax and other one with pleural effusion. Both patients were managed well one with chest tube and other conservatively. Chest tube was removed after 24 hours. There was no other post chest tube complication. These 2 patients had complained of respiratory difficulty, pain in lower chest and tachypnoea. None of these studies take in to account of symptoms of patient. We found in our study that routine chest x-ray is not required and only symptomatic patients were to be exposed to chest x-ray. Also having more patients with symptoms without any x-ray finding also suggests that not all complications can be picked by chest x-ray. So use of ultrasound CT or any other modality can be sought in these symptomatic patients to find the cause of complain.

In conclusion, it is not necessary to do
routine chest x ray after supra costal PCNL rather investigating only symptomatic patients would be more rational approach.

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