

Original Research Article

<http://dx.doi.org/10.20546/ijcmas.2016.506.035>

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

Devendra Singh Pawar¹, Ashok Kumar¹, Santosh Kumar Singh¹ and Seema Mittal^{2*}

¹Department Urology, Pt. B.D.S. PGIMS, Rohtak-124001, Haryana, India

²Department of Microbiology, BPSGMC (w) Khanpurkalan, Sonapat, Haryana, India

*Corresponding author

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 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. 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.

Article Info

Accepted:

15 May 2016

Available Online:

10 June 2016

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 c 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 xray 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 in 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.

References

- Ahmed, A.I., Muzrakchi, W., Szmigielski, Ahmed, J.S., Omar, Nagy, M., Younes. 2004. Is the 10th and 11th Intercostal Space a Safe Approach for Percutaneous Nephrostomy and Nephrolithotomy? *cardiovascular and interventional radiology*, Volume 27, Number 5, 503-506.
- Bjurlin, M.A., O'Grady, T., Kim R, Jordan, M.D., Goble, S.M., Hollowell, C.M. 2012. Is routine postoperative chest radiography needed after percutaneous nephrolithotomy? *Urol.*, 79(4): 791-5. Epub 2011 Nov 16.
- Golijanin, D., Katz, R., Verstandig, A., Sasson, T., Landau, E.H., Meretyk, S. 1998. The supracostal percutaneous nephrostomy for the treatment of staghorn and complex kidney stones. *J. Endourol.*, 12: 403-5.
- Gupta, R., Kumar, A., Kapoor, R., Srivastava, A., Mandhani, A. 2002. Prospective evaluation of safety and efficacy of the supracostal approach for percutaneous nephrolithotomy. *BJU Int.*, 90(9): 809-13.
- Hopper, K.D., Yakes, W.F. 1990. The posterior intercostals approach for percutaneous renal procedures: risk of puncturing the lung, spleen and liver as determined by CT. *AJR*, 154: 115-117.
- Hossain, M., Ullah, A.T., Regmi, S., Rahman, H., Kibria, S.A. Safety and efficacy of the supracostal access for percutaneous nephrolithotomy: our initial experience.
- Kekre, N.S., Gopalakrishnan, G.G., Gupta, G.G., Abraham, B.N., Sharma, E. 2001. Supracostal approach in percutaneous nephrolithotomy: experience with 102 cases. *J. Endourol.*, 15(8): 789-91.
- Lang, E.K., Thomas, R., Davis, R., Colon, I., Cheung, W., Sethi, *et al.* Risks and benefits of the intercostal approach for percutaneous nephrolithotripsy. *Int. braz. J. urol.*, vol.35 no.3.
- Ogan, K., Corwin, T.S., Smith, T., Watumull, L.M., Mullican, M.A., Cadeddu, J.A., Pearle, M.S. 2003. Sensitivity of chest fluoroscopy compared with chest CT and chest radiography for diagnosing hydropneumothorax in association with percutaneous nephrostolithotomy. *Urol.*, 62(6): 988-92.
- Picus, D., Weyman, P.J., Clayman, R.V., Mcclennan, B.L. 1986. Intercostal -space nephrostomy for percutaneous stone removal. *AJR*, 147: 393-397.
- Segura, J.H. 1989. The role of percutaneous surgery in renal and ureteral stone. *J. Urol.*, 141: 780-781.
- Wolf, J.S. Jr, Clayman, R.V. 1997. Percutaneous nephrostolithotomy; what is its role in 1997. *Urol. Clin. North Am.*, 24: 43-58.
- Yadav, R., Aron, M., Gupta, N.P, Hemal, H.K., Seth, A., Kolla, S.B. 2006. Safety of supracostal punctures for percutaneous renal surgery. *Int. J. Urol.*, 13(10): 1267-70.

How to cite this article:

Devendra Singh Pawar, Ashok Kumar, Santosh Kumar Singh and Seema Mittal. 2016. To Find Role of Routine Chest X Ray in Case of Supracostal PCNL: Can Complains and Physical Examination Replace it. *Int.J.Curr.Microbiol.App.Sci*. 5(6): 310-313.
doi: <http://dx.doi.org/10.20546/ijemas.2016.506.035>