



## Role of Routine Chest Roentgenography in Patients with Open Heart Operation

A. G. Ahangar, A. M. Dar, I. A. Mir, M. A. Bhat, G. N. Lone, S. H. Shah

### Abstract

Three hundred and seventy four random patients admitted to the postoperative intensive care unit (ICU) underwent postoperative clinical positioning of endotracheal tube (ET), nasogastric tube, central venous catheter and laboratory arterial blood gas (ABG) assessment. Chest roentgenography was done for all the admitted patients and the findings reviewed. Thirteen (3.47%) patients required intervention because of abnormalities detected on chest roentgenography. None of the pathologic conditions detected was life threatening. Chest roentgenography on admission to the cardiovascular ICU should be done only if the surgery has been performed for cardiac trauma, re-exploration, and also if clinical and laboratory assessment indicate the possibility of underlying pathologic conditions that can only be confirmed by chest roentgenography.

### Key Words

Cardiac operations, Chest roentgenography

### Introduction

For many years, it has been routine practice to carry out chest radiography in many institutions after heart operations. However, doubts have been expressed concerning the need for this examination except when the medical history, clinical examination and laboratory data suggests some intrathoracic pathology. Since cardiac operation done via median sternotomy facilitates inspection of the mediastinum and allows for the assessment of lung movement, it has been suggested that routine postoperative chest roentgenography may be omitted. The doubtful clinical value of immediate

postoperative chest roentgenography prompted us to study whether it is really necessary to continue the practice of performing chest roentgenography on every patient after cardiac surgery. The goal is being to know the presence of underlying pathology which may need surgical intervention.

### Material and Methods

The study was conducted in the department of Cardiovascular and Thoracic Surgery on 374 patients. All the patients were admitted in the ICU after heart

From the Departments of Cardiovascular and Thoracic Surgery SK Institute of Medical Sciences, Srinagar (J&K) India.  
Correspondence to : Prof. A. G. Ahangar, HOD, Cardiovascular & Thoracic Surgery, SKIMS, Soura, Srinagar-190011 India.

operations done via median sternotomy. 318 patients remained on ventilator from 6 to 40 hours. On admission to ICU patient underwent clinical and laboratory assessment by cardiovascular ICU team. The position of ET tube was assessed clinically and by regular blood gas analysis. CVP line helped in measuring central venous pressure (CVP). The position of nasogastric tube was assessed by suctioning of gastric contents. Hemodynamic stability of cardiovascular system was considered when systolic blood pressure was more than 90mmHg, heart rate of 70-90 beats per minute. Excessive blood loss was diagnosed if the bleeding exceeded 200 ml per hour for three consecutive hours or more than 1000 ml in one hour. Routine arterial blood gas (ABG) was done every two hourly. Having and presuming everything in normal limits a routine sitting portable chest roentgenograph was done. The findings of roentgenography were recorded by the dealing resident and consultant.

**Observation**

Thirteen (3.47%) patients required intervention because of abnormalities. Of the total abnormalities, majority 50% were observed in patients having surgery for trauma, followed by the re-exploration group 15.78% (Table I). The common abnormalities as observed in chest roentgenography are given in table II. Hypoxaemia  $PO_2 < 60$  mmHg was observed in 27 patients but none was in abnormal roentgenographic group and all these were extubated in operation theatre only. The significance of roentgenography gained momentum in the traumatic and re-exploration group where of the thirty-three patients, 10 patients (30.30%) were in abnormal roentgenography group and 6, (18.18%) patients died on third through seventh day.

**Table 1: Roentgenographic abnormalities observed in surgical procedures**

Operation on heart for	Number of patients	Complications in number of patients	%age
Trauma	14	7	50.00
Re-exploration	19	3	15.77
TOF	10	1	10.00
DVR	21	1	4.76
ASD	109	2	1.12

The percentage of abnormalities out of total number of 374 patients was 1.82, 0.80, 0.26, 0.26 and 0.26 percent respectively.

**Table 2: Roentgenographic abnormalities**

Findings	Right	Left	Bilateral
Edema	-	-	5
Effusion	4	7	1
Collapse	3	5	-
Pneumothorax	1	0	-

**Discussion**

A routine chest roentgenography is one ordered without any firm specific medical indications and without a reasonable probability that pulmonary or cardiac disease is present which can be treated more effectively as a result of early detection (1). However, the role of routine chest roentgenography after cardiac surgery is now least recommended. The need for routine non-selective chest roentgenography on admission to ICU after cardiac operations has been questioned. Not only the radiation risk even the information obtained has virtually no additional diagnostic yield (2,3). The observations that postoperative roentgenography is not of much help, is at variance with others who observed atelectasis in 30% of patients after coronary artery bypass grafting (CABG) (4). Even the value of routine preoperative chest x-ray has been debated (5).

Results of our study clearly indicate that their is no need to perform routine chest roentgenography after cardiac surgery, but the same cannot be omitted in

post-traumatic cardiac surgery, in patients who are re-explored for one or the other reason after cardiac surgery as observed by Walter *et. al.* also (6). Having witnessed the present turmoil in Kashmir for last about 14 years now, the emergency cardiac/extracardiac operations are performed off and on. Since heart takes priority in disasters some trivial lung/chest injuries may be missed and also the radiological evidence of hemo/pneumothorax or any other pulmonary pathology may take some time to develop and can be missed in first x-ray and during cardiac surgery. Our results are at variance with those other reported studies (2,3,7) probably because post-traumatic emergency cardiac operations and the re-exploration group constitutes about thirty-three patients in our study. But again the abnormalities are not as high as 30% (4).

We conclude that routine chest roentgenography should be done only if the hemodynamic, clinical and laboratory assessments indicate the possibility of underlying pathologic conditions<sup>7</sup> and in patients having undergone post traumatic cardiac surgery or re-explorations.

#### References

1. Robin E, Burke C. Routine chest x-ray examinations. *Chest* 1986 ; 2 : 258-62.
2. Hornick PI, Harris P, Cousins C, Taylor KM, Keogh BE. Assessment of the value of the immediate postoperative chest radiograph after cardiac operation. *Ann Thorac Surg* 1995 ; 59 : 1150-54.
3. Stevens JJ, Booth JV, Little J, et al. The value of immediate postoperative chest radiograph in adult cardiac surgery (abstract). *Br J Anaesth* 1995 ; 74 : 110.
4. Wieneer-Kronish JP. Postoperative pleural and pulmonary abnormalities in patients undergoing coronary bypass grafts (Editorial). *Chest* 1992 ; 102 : 1313-4.
5. Archer C, Levy A, McGregor M. Value of routine preoperative chest x-rays: a meta analysis. *Can J Anaesth* 1993 ; 40 : 1022-27.
6. Walter O'Breins, Jacek M. Karski, Dary Cheng, JO Corroll-Munro, Charles Peniston and Allen Sandler. Routine chest roentgenography on admission to intensive care unit after heart operation: Is it of any value? *The Journal of Thoracic and Cardiovascular Surgery* 1997 ; 113 : 130-33.
7. Westaby S, Pillai R, Parry A, et al. Does modern cardiac surgery require conventional intensive care? *Eur J Cardiothorac Surg* 1993 ; 7 : 313-18.

## Logi-Cal<sup>TM</sup> M

More than just a Calcium supplement

Growing Children



Pregnant Women

More Calcium

More Minerals

More Cost Effective

Geriatric patients



Lactating Mothers



El. Calcium (as Calcium Carbonate)	500 mg
Vitamin D <sub>3</sub>	400 IU
El. Magnesium (as Heavy Magnesium Oxide IP)	40 mg
El. Manganese (as Manganese Sulphate USP)	2 mg
El. Zinc (as Zinc Sulphate IP)	7.5 mg
El. Copper (as Coper Sulphate IP)	1 mg



**Serum International Ltd. Pune-28**

Enquiries : 511, Dajmal Tower, 211, Nariman Point, Mumbai - 400 021. Tel. : 2284 0337/0370, 2283 0147 Fax : (022) 2204 4389