

# Fatal Air Embolism Following Retroperitoneal Air Insufflation

(A Case Report)

By

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## SUMMARY

*A case is reported who developed pulmonary air embolism during retroperitoneal air insufflation undertaken to study the renal outlines. The possible mechanism of this complication and the method to avoid this are discussed.*

## INTRODUCTION

Injection of air into the retroperitoneal space was introduced as a roentgenographic method by Carelli and Sordell<sup>1</sup> in 1921. Initially, air was injected through the flanks. Since the presacral route for gas insufflation was introduced by Rivas,<sup>5</sup> this approach has gained more popularity than that of flank injection. Its most important complication, though rare, is gas embolism. We present such a case who developed pulmonary air embolism during retroperitoneal air insufflation undertaken to study the renal outlines.

## CASE REPORT

Smt. A, a 35 year old housewife was admitted in a peripheral hospital for uterine fibroid surgery. She was given 3 transfusions of whole blood, as she was found to be anemic. Following the third transfusion, she developed rigors and anuria. She was also mildly icteric and hence a mismatched transfusion was suspected. In view of the anuria, azotemia and hyperkalemia, she was transferred to the A.K. Department and was given two hemodialyses. Following this, she opened up and her azotemia came down. In order to find out the

cause of the renal failure, a high dose intravenous urogram was done which failed to reveal the renal outlines and did not show any excretion. Hence retroperitoneal air insufflation was undertaken prior to kidney biopsy. The patient was put in the left lateral position with the right thigh flexed over the abdomen. Identifying the coccyx, with one finger in the rectum, a 20 gauge needle was introduced in the presacral region after giving local anaesthesia. Confirming that the initial aspiration did not reveal blood, 30 ml of saline was first injected. Then about 1200 ml of air was injected slowly in instalments of 50 ml. Towards the end of the injection, it was realised that the patient's heart had stopped. Immediately the injection was stopped and resuscitative measures were undertaken. In spite of prolonged efforts, the patient did not survive. Radiographs taken during the time of resuscitation showed air in the portal and superior mesenteric veins and in the mediastinum (See Figs. 1 and 2 on page 190 B). An autopsy done showed extensive air in the IVC and right side of the heart.

## DISCUSSION

Retroperitoneal air insufflation is a useful procedure in the diagnosis of suprarenal masses and retroperitoneal tumours and in outlining the kidneys. The usual

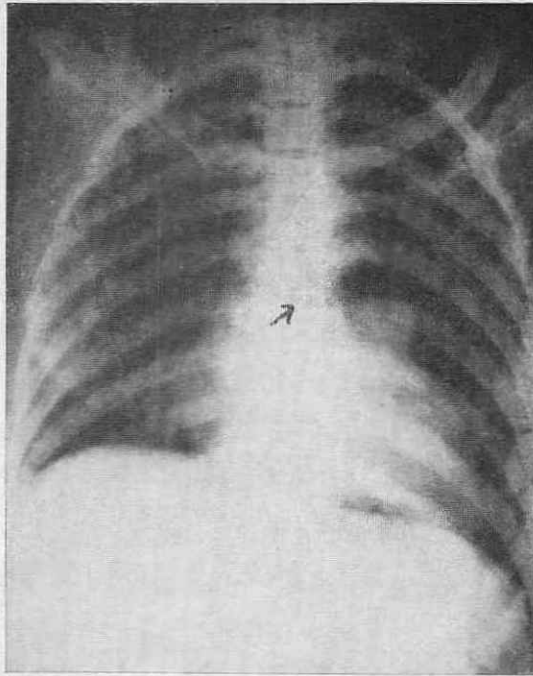


Fig. 1: X-ray of the chest showing air in the mediastinum.

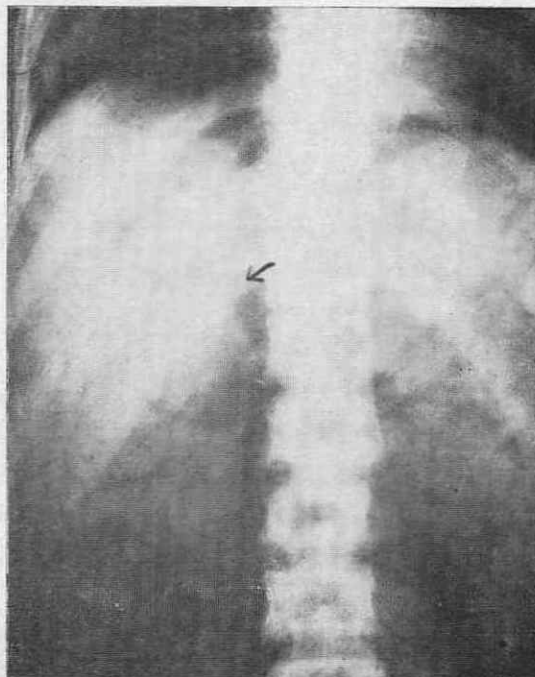


Fig. 2: X-ray of the abdomen showing air in the portal vein and its branches.

complications are temporary discomfort after the procedure, subcutaneous emphysema on the abdomen, genitals and neck, and retroperitoneal infection etc. Gas embolism is a rare, but definite complication of the procedure.<sup>2,3</sup> It develops in an appreciable percentage of cases after translumbar injection but less after presacral injection. So far, in our series of 64 cases of retroperitoneal air insufflation, only one patient developed air embolism during the procedure to which she succumbed. Six patients had subcutaneous emphysema following the procedure and almost all patients had abdominal discomfort lasting for a few hours.

Ransom *et al*<sup>4</sup> concluded from their nationwide survey that air embolism may have occurred 122 times in some 12,000 cases with a mortality rate of about 0.5%. There has been no appreciable difference in the incidence, whether air or oxygen was used. Air being cheap and most readily available is usually used. However, carbon dioxide may be preferred because it is 20 times more soluble than oxygen. Usually gas embolism occurs as a result of laceration of the retrorectal veins. When the vein gets lacerated air will be sucked. This may happen even if the vein is not primarily injured by the needle but becomes lacerated from separation of tissue spaces by increasing volume of the injected gas. Ideally, therefore, gas should be injected only when the patient is in a position in which the retrorectal venous plexus lies well below the right cardiac chamber.

When so situated, the vessels when injured will bleed instead of sucking up air. Prophylaxis would therefore, require a change of position after introduction of the needle. Introduction of polythelene tube as suggested by Landes and Ransom<sup>4</sup> is helpful in this respect.

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