

# SELECTIVE PERCUTANEOUS TRANS-CRICO-THYROID BRONCHOGRAPHY WITH A LONG POLYETHYLENE CATHETER

By A. Galanti, M.D., C.M., L.M.C.C., C.R.C.P. (C.), A.C.R.\*

and

Wong Wai Kwan, M.B., B.S.

(Department of Radiology, University Hospital, University of Malaya, Kuala Lumpur)

Trans-crico-thyroid bronchography by direct needle puncture of the crico-thyroid membrane is a well-known technique for visualisation of the bronchial tree. Since the first direct needle puncture was performed in 1922 by Sicard J. A., Forestier, J. and Aime, Brodin and Wolff there have been modifications to the basic technique. In 1959, Willson J. K. V. described a new method of crico-thyroid puncture bronchography using a short polyethylene catheter which was threaded through a previously inserted needle and the needle subsequently removed.

In 1965 Rossi *et al*, described a method of trans-crico-thyroid bronchography using a radiopaque catheter which was inserted into the trachea over a guide wire and placed within the selected bronchus using the Seldinger technique.

This report describes another modification of trans-crico-thyroid bronchography using a Normacanth needle and a long (50 cm. in length) polyethylene catheter which can be placed selectively.

## DESCRIPTION OF LONG POLYETHYLENE CATHETER TECHNIQUE

Premedication is given to all adult patients and consists of Oral Nembutal 50 mgs. and Oral Codeine Phosphate 30 mgs. one hour before the procedure. Injection of atropine 0.6 mg. is also given half an hour later. The local anaesthetic used is Xylocaine 1% and the amount used varies from 3-4 ml. The contrast materials used are Dionosil (aqueous) and Hytrast.

The necessary equipment is shown in (Fig. A). The patient is placed supine on the X-ray table with a folded pillow under the shoulders to ensure full extension of the neck (Fig. B).

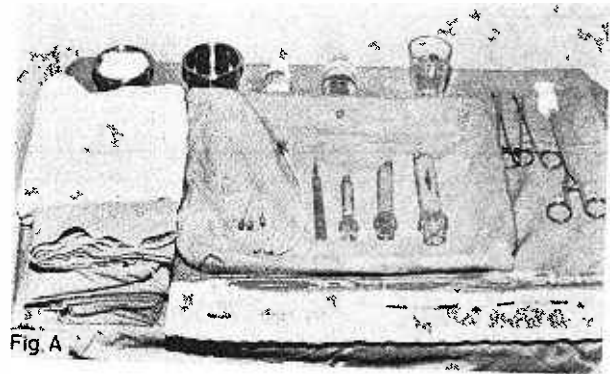


Fig. A.

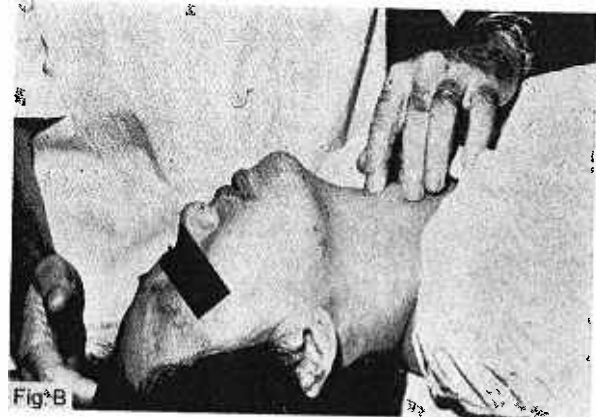


Fig. B.

The crico-thyroid notch is localised by palpation and an ink mark made accordingly on the side of the neck.

Following cleansing of the skin over and around the crico-thyroid notch with iodine tincture, the skin and subcutaneous tissue is infiltrated with 1% Xylocaine using a No. 23 gauge needle. The needle is withdrawn after the infiltration and a No. 20 gauge needle is used to puncture the crico-thyroid membrane. In order to test whether the needle is inside the trachea, the plunger is withdrawn, and if the needle is in the lumen, bubbles of air will enter the syringe. When this is seen, 1 ml. of Xylocaine is injected quickly. The needle is then withdrawn.

\*From: The Foothills Hospital—Calgary, Alta., Canada.  
Visiting Associate Professor, Radiology—Canadian Colombo Plan.

A small skin incision is made at the site of puncture in the midline. A Normacanth needle (No. 14 gauge with a guard 1" from the tip) is inserted through the crico-thyroid notch into the lumen of the trachea. The needle is then angled 45° caudally (Fig. C). A No. 18 gauge polyethylene catheter (50 cm. in length) is threaded through the needle into the trachea for a length of about 5 inches. As soon as the catheter is in place the needle is withdrawn and the guard pushed downwards to cover the tip of the needle. This is to prevent the tip of the needle puncturing or cutting the catheter.



Fig. C.

The catheter is taped with adhesive plaster as shown in (Fig. D). 1-2 ml. c.c. of Xylocaine is then injected through the catheter to stop or prevent any coughing.

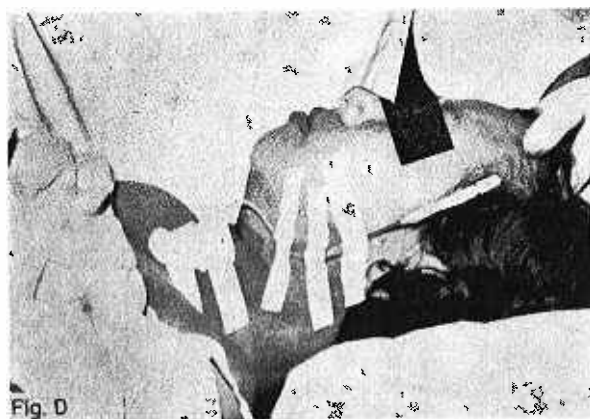


Fig. D.

The pillow under the shoulders is then unfolded and placed under the head. After that the table is elevated about 20-30 degrees.

1-2 ml. of contrast medium (Aqueous Dionosil or Hytrast) is injected by the nurse under fluoroscopy to localise the position of the catheter. The catheter is then introduced by gentle manouvring and by proper positioning of the patient under fluoroscopy control into the segmental bronchus under consideration. If there is any cough stimulus during introduction of the polyethylene tube, 1-2 ml. of Xylo-

caine is again injected into the bronchus before further introduction of the contrast material.

A plastic connecting tube is placed between the syringe and the intra-tracheal catheter. This is desirable as it allows greater freedom of movement for positioning and also to minimize radiation to the hands of the nurse.

The remainder of the procedure is similar to that of other bronchographic techniques.

Following completion of the study, the catheter is removed after first flushing it with air to prevent any contrast medium being left in the soft tissues during withdrawal. The puncture site is then covered with a piece of gauze and fixed in position with adhesive plaster. The patient is advised not to eat or drink for 3 hours.

## DISCUSSION

This method has been introduced by us at the University Hospital of the University of Malaya in Kuala Lumpur 18 months ago and since then it has been the only method for bronchography either selective or not. We have performed 80 bronchograms with preference to unilateral bronchogram in a single sitting. The method has given us successful diagnostic results in all our cases.

The advantage of our technique in comparison with other previous percutaneous transtracheal ones consists in the length of the plastic tube which allow us to perform, under fluoroscopic control, a selective bronchography which is of particular value in bronchographic diagnostic studies of peripheral lesions. Our limitations have been the impossibility of performing selective bronchograms of the bronchi for the right upper lobe and for the anterior and postero-apical branches for the left upper lobe. For those segmental bronchi the injection has either to be done by gravity or by the catheterization method described by Rossi.

The good results of our method are due to its simplicity, to the minimal discomfort to the patient, to the small quantity of contrast material necessary for the bronchogram and, least but not last, to the possibility of selectively increasing the hydrostatic pressure of the contrast medium at the level of the lesion, which is particularly important for the bronchographic examination of peripheral lesions. Apart from the general complications which are common to any bronchography we had only two cases of subcutaneous emphysema which lasted only 24 hours.

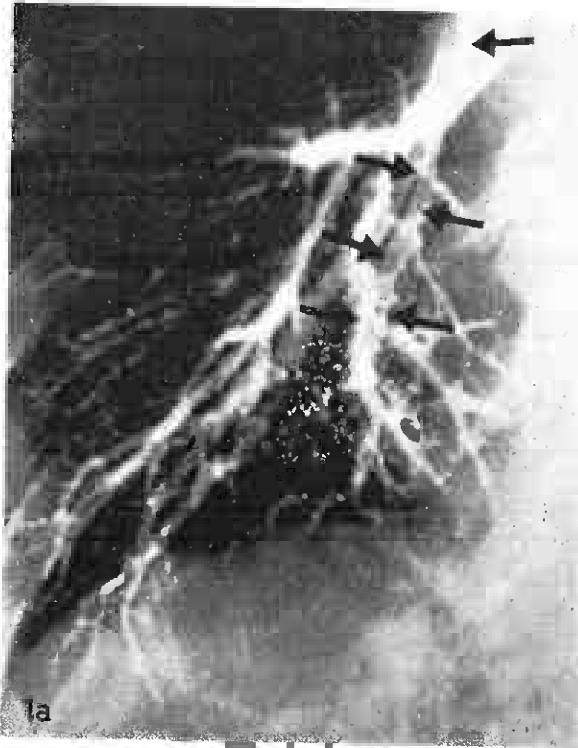


Fig. 1(a).

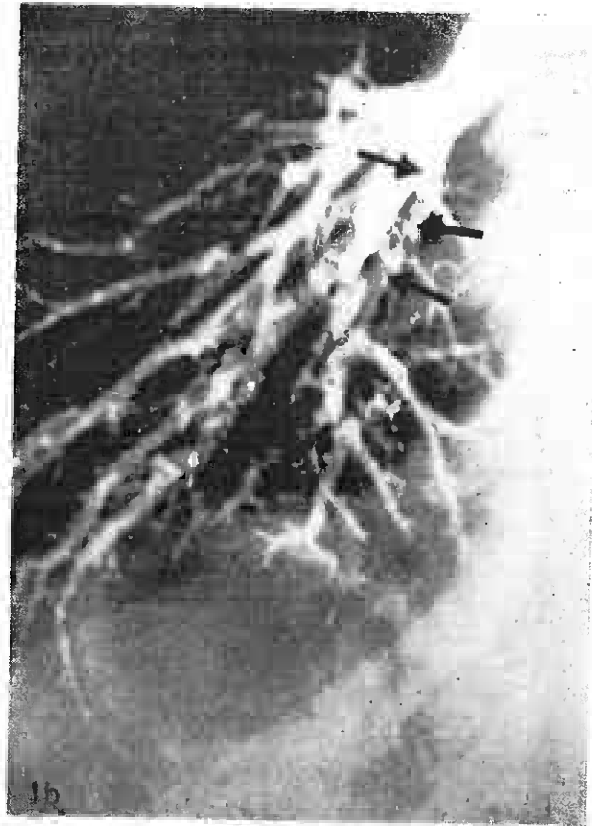


Fig. 1(b).

Figs. 1(a) and (b). Note the cystic lesion in the right pulmonary base with displacement of terminal bronchi around the lesion. The tiny plastic tube (see arrows) is in distal end of the bronchus for the medial basal segment of the right lower lobe.

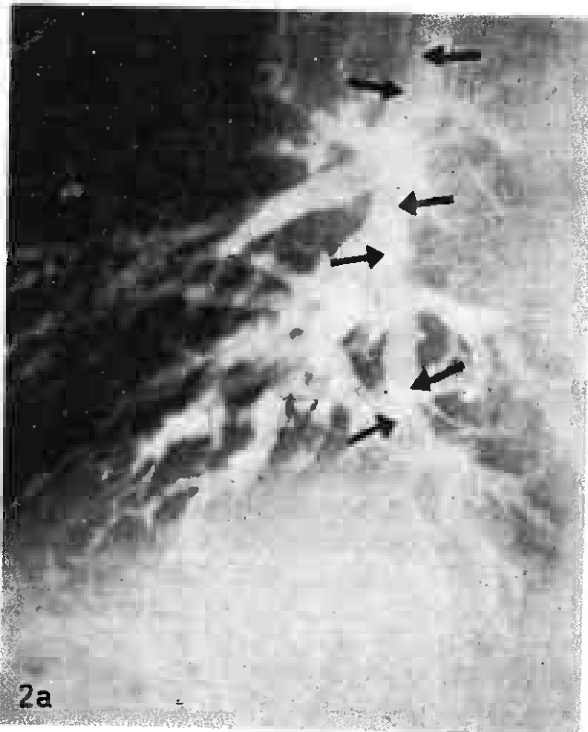


Fig. 2(a).



Fig. 2(b).

Figs. 2(a) and (b). Note the mass lesion in the posterior segment of the right lower lobe with obstruction of one terminal bronchus at the proximal margin of the lesion. The tiny plastic tube (see arrows) is in one terminal bronchus for the posterior segment of the right lower lobe.

Some soreness of the neck has been noted in a few patients for 1-2 days.

No local bleeding has ever occurred in our cases.

We report 2 cases of selective bronchography. In the first case our method has diagnosed a cystic lesion at the base of the right lung. This lesion had been missed in two previous bronchographies done with transglottic method (Figs. 1(a) and (b)).

In the second case the selective bronchography has shown the displacement and obstruction of some terminal bronchi at the level of a mass lesion located in the posterior segment of the right lower lobe. The lesion was clinically diagnosed as a bronchogenic carcinoma, but the patient refused intervention (Figs. 2(a) and (b)).

### SUMMARY

A trans-crico-thyroid selective bronchographic method is described. We use a No. 18 gauge, 50 cm. long polyethylene catheter which allow us to perform a selective introduction of the catheter in the segmental bronchi for the lower lobes, right middle lobe and lingula.

This method has been introduced as a routine procedure at the University Hospital, Kuala Lumpur with very good results, since November 1968 and 80 bronchograms have been performed so far.

The technique is simple, well accepted by the patients and the amount of contrast medium

introduced is reduced in comparison to that of the transglottic method.

Very good diagnostic results have been obtained especially in the differential diagnosis of peripheral inflammatory and neoplastic lesions.

Complications are rare. In our series only two cases of temporary subcutaneous emphysema, have been observed.

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