



## **Wellcome Film Project**

### **Fibre Optic Bronchoscopy**

**The University of London**

**Video Library of Clinical Procedures**

**Presented by Dr Philip Hugh-Jones, King's College Hospital.**

**University of London Audio-Visual Centre, [no date].**

**Made for British Postgraduate Medical Federation.**

**Black-and-white**

**Duration: 00:20:06:20**

**00:00:00:00**

**<Opening titles>**

**<Hugh-Jones intermittently to camera while demonstrating the rigid bronchoscope and the fibre optic bronchoscope in detail>**

Up until, perhaps, two or three years ago, bronchoscopy was always done by using a rigid bronchoscope. Now, the rigid bronchoscope simply consisted of a slightly tapered brass tube into which could be inserted a light source; and the operator could then look down the bronchoscope and see the illumination at the other end, so that when this tube was inserted through a patient's mouth, through his larynx and into the trachea, the operator could inspect the different lobar orifices of the bronchial tree. And this was made more practicable by putting a telescope down the bronchoscope, giving him close-up vision.

When he'd inspected the bronchial tree, it was possible to take biopsies by these rather large biopsy forceps, and a chunk of tissue was taken by shutting the forceps which were inserted down the bronchoscope. At the same time, suckings could be

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taken using a sucker, and secretions sent for bacteriology, or for cytology by sucking up the bronchoscope.

This procedure tended to be a quite serious procedure because if the biopsy were a big one, occasionally one could get dangerous bleeding, and if that occurred then, of course, there was the risk of hypoxia and cardiac arrest so that it tended always to be done in operating theatre conditions.

More recently, a flexible fibre optic instrument has been introduced which consists of a lens system here, down which one can look, and that is joined to a very small tube which is small enough to be inserted through the patient's nose so that it passes through the nose and then down into the larynx. Now, you can imagine that having a rigid bronchoscope passed through the mouth tended to be rather uncomfortable, so most patients preferred having rigid bronchoscopy done under general anaesthesia. Whereas we now do flexible fibre optic bronchoscopy simply by a local anaesthetic in the nose.

Now, if again we look at the instrument, you will see that one can manipulate the end of it from the operator's end and the instrument can then be wiggled around to inspect different parts of the tree. And because it is so small, it can go not only into the lobar bronchi but right on into segments and sub-segments. Now, if we turn the light off and look at the end of the bronchoscope here, you can see that there are three channels. There is first of all that channel there down which the efferent light goes; the other light here which shines the light back into the operator's eye, and finally there is this big channel here which is a biopsy channel down which suction can be taken, or biopsy forceps introduced. So if we introduce the biopsy forceps on their long wire into the proximal end of the instrument, I can poke them down until they come out of the distal end, and then by manipulating the proximal end, you can see the biopsy forceps opening and shutting.

Now, as an alternative to taking a biopsy like that, we can take that out and we can insert a brush down the same channel. This consists of a rather stiff nylon brush which again will come out the end of the bronchoscope and can be rubbed up and

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down against where we suspect a carcinoma or other pathological lesion, and then the cells transferred from that onto a slide for cytology.

Now, if we withdraw the brush you will realise that throughout the procedure we can take suckings by simply occluding this hole and we then suck back along this channel into a trap so that any suckings will be sent off for bacteriology. And at the same time into this hole, here, we can inject saline or, if necessary, local anaesthetic, so that the whole procedure is an extremely satisfactory one and because the biopsies are so small, the risks of bleeding and so on are negligible.

But I don't want you to go away with the idea that fibre optic bronchoscopy has completely superseded rigid bronchoscopy, that's not true. We still do use the rigid bronchoscope but perhaps in only 5 or 10% of cases. It's quite obvious that a rigid bronchoscope is much better for taking out foreign bodies from the bronchial tree and sometimes, if we fail to get a proper biopsy, with these little tiny biopsies at fibre optic bronchoscopy, we would repeat the bronchoscopy using a rigid bronchoscope essentially to get a bigger biopsy. But one other great advantage of the fibre scope is not only that one can look far further out into the tree, but those forceps which you saw me put down the biopsy channel can be extruded well beyond the end of the bronchoscope, right into the periphery of the lung, and if we do the whole procedure under x-ray screening, biopsies can be taken right out as far as the pleura, or biopsies can be taken across the bronchial walls and we can safely obtain small lung biopsies.

Let's now see fibre optic bronchoscopy and begin by looking at the x-rays of our patient.

**00:07:05:00**

**<Hugh-Jones narrates over chest x-ray>**

This patient is a 55-year-old lady who had a perfectly clear chest x-ray 5 years ago, but when she had a recent chest x-ray, it showed a small shadow here at the anterior

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end of the 7th rib. On looking at the tomograms, this shadow becomes much more obvious and from the tomographic position at 14cm we can show that it is in the anterior segment of the right upper lobe. So we'll look at her with a flexible fibre optic bronchoscope and take suckings from within that segment and possibly a biopsy if there is anything to see.

### <Hugh-Jones narrates over detailed shots of female patient being prepared for fibre optic bronchoscopy procedure>

It's highly probable that we won't see any abnormality because you will remember that the small shadow is a very tiny one and rather peripherally in the lung field.

The anaesthetist is now going to give the patient a local anaesthetic, and although it is just a local procedure, we always insert a butterfly needle into the hand, so that the veins are readily available. In this particular patient, she is not in any way nervous so we won't give her any systemic anaesthesia.

The anaesthetist is now looking at the patient's nostrils and is going to insert into each nostril some Moffat solution – Moffat solution is a convenient substance for local anaesthetic of the nose. It contains cocaine together with a small quantity of adrenaline and bicarbonate. He's now taking out the patient's tongue and going to spray inside her mouth with the lignocaine.

Next, we usually give a cricoid injection of 1ml of 4% lignocaine. This tends to make the patient cough as it goes in but therefore scatters the local anaesthetic around the bronchial tree. He's now inserting the needle into the trachea and will pull back the plunger of the syringe to make sure that air comes back out and he is in the trachea. And as he injected the anaesthetic so the patient coughed as we expected.

Although this bronchoscopy is not essentially a sterile procedure in the normal operative sense, we obviously have to keep the actual bronchoscope sterile and so it's convenient to have a sterile towel on which we can lay the instrument. We've got here the camera which we normally use for television so that we can demonstrate to

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students and to the surgeon and other people who are interested, what is seen at the actual bronchoscopy with the monitor below us. And the patient should be comfortably sitting up ... *<to patient>* you're feeling all right are you? *<patient nods>* good.

So, if I could have the bronchoscope please.

**00:10:57:19**

**<Hugh-Jones takes bronchoscope and performs procedure, describing what he does as he goes on>**

The bronchoscope itself simply flexes in two planes and we check to make sure that the light is running. That seems to be fine. And now I'm going to attach the bronchoscope to the camera and again check that everything is running correctly.

Now, there's some lubricant to put onto the bronchoscope which is simply an anaesthetic jelly and then what we're going to do is to simply insert this up your nose *<to patient>* my dear, what I want you to do is to just breathe away quite quietly and quite normally; it's better to be able to breathe through your mouth, I shall be able to talk to you but I'd rather you didn't talk to me unless it's uncomfortable. If it is, you let me know.

Now I'm just going to see which nostril is correct [...]

**<Hugh-Jones over shots of the view from the bronchoscope>**

[...] this one seems quite satisfactory and we're running along the floor of the nose, and as we come over the end here we should shortly see the epiglottis come into view. Now you can see the epiglottis and there are the vocal cords. I don't think we need put any anaesthetic on the cords because you have given her ... and now I've gone through the cords. There's a perfectly normal trachea and as we come down the trachea, we can see the main carina.

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Now I'd like to insert a little local anaesthetic onto the main carina, could I have the anaesthetic please? This is just now 1ml of 4% lignocaine which we're squirting down and following by a little air to make sure that it goes onto the carina. And now when we look down the bronchoscope again one can see the main carina quite sharp there, and we'll look first of all down the side that we're less interested in, namely the left-hand side. And we're now going down the long left main bronchus, and there is the division between the left upper and left lower lobes.

All that is quite normal. And looking now into the left lower lobe you can see the apical segment which is a big one, and then in the distance there, the basal segments of the left lower lobe. And looking now into the upper division there is the lingula straight in front, and then the upper part with the apicoposterior and anterior segments. All that is entirely normal.

So we'll now withdraw the bronchoscope as far as the main carina, which is there, well into view again, and now we look down the right-hand side, and almost opposite the main carina there is the entrance to the right upper lobe, slightly narrowed but not at all markedly abnormal. Then we go down the right main bronchus – there's the middle lobe with the apical segment of the lower lobe almost opposite to it, and then in the distance, here, there's the apical segment, and then in the distance there, the three basal segments of the lower lobe. All those are quite normal. There's a fair amount of secretion in the tree but not remarkable.

Now, we're now going to look at the part which interests us, namely the right upper lobe, so I'm curving the end of the bronchoscope and I'm going into the right upper lobe. There is the entrance to the right upper lobe, and there are its three segments.

**00:15:15:00**

The apical anterior and posterior segments. Now, we're interested in the anterior segment, which is what we're doing. *<shot of Hugh-Jones performing procedure>* And I'm just going to take some suckings from that into a track please. There we are,

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there we are, into the upper lobe orifice with its three segments and that is the anterior segment. Can we insert some saline please, do some washing? The patient is coughing so I'm not going to be too long. Right, thank you, that'll do for the washing.

Now, we'll take, or attempt to take a small biopsy from within this segment *<back to shot from bronchoscope>* - can I have some biopsy forceps please? You can see the three segments quite nicely now. And I'm simply now inserting the biopsy forceps. Those are the three segments of the right upper lobe. Now, open, shut, no, got nothing. Open, now shut. All right *<to patient>* my dear? All right, we've nearly finished now. It's all right dear, that's fine. Have you got a biopsy there? All right, good. Now have you got a brush?

Now, we can see now a small amount of haemoglobin is coming from the orifice to the right of the lobe where we took the biopsy, and now I'm going to insert a brush and take some brushings from within that segment. Now, we've brushings from within the relevant segment, and now I'm going to take the bronchoscope out. Well done, my dear, that's all. Now the brushings go straight onto a slide and are immediately fixed in alcohol for cytology. Well done. Take that off, thank you.

Now, there's only one important thing: *<to patient>* nothing to eat or drink for another two hours. You can rinse your mouth out with water, don't try swallowing even water otherwise it all goes down the wrong way. All right? Good. *<patient>* Two hours? *<Hugh-Jones>* Two hours. Good. Thank you.

**<End credits**