

# VIDEOSCOPIC PLEURECTOMY

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## ABSTRACT

**Since June 1992, 21 patients were treated for spontaneous pneumothorax by video assisted thoracoscopic surgery (videoscopic pleurectomy). The total number of operations were 23. There were 13 male and 8 female patients, aged between 17 and 67 years (mean 42 years). There were 12 right-sided and 11 left-sided pneumothoraces. In 16 instances the indication was recurrent pneumothorax, 6 had prolonged air leak extending more than 14 days. Two patients had prophylactic pleurectomy after one episode of pneumothorax, one being asthmatic and the other a scuba diver. The mean operating time was 70 minutes, mean hospital stay 3 days. Blood loss in all but one case was less than 150 mls. PJCTS 2000; II:10-13**

## INTRODUCTION

Spontaneous pneumothorax is primarily a disease of young people <sup>(1-2)</sup> with an approximate incidence of 74-78 per million <sup>(3)</sup> and a predominance in males, (5:1). Elaborate history <sup>(4-5)</sup> and morphology <sup>(6)</sup> of this disease already features in the literature. Usually small pneumothorax is not noticed by the patients and ignored as once off discomfort and slight tightness in the chest. Unless it persists, or progresses. Management in a hospital is either for simple observation in about 29% of cases or with chest tube insertion in about 21% <sup>(7)</sup>. Chances of ipsilateral recurrence after first episode of pneumothorax is 14% which progressively increases to 80% after the third episode <sup>(8)</sup>. In certain circumstances pneumothorax can be more serious and life threatening e.g. simultaneous Bilateral, in asthmatics, patients with one lung following pneumonectomy, deep sea divers, and air crew <sup>(9)</sup>. Surgical intervention is indicated prophylactically after first episode in high risk patients, and those where the air leak is for more than 10-14 days, or in cases when lung fails to re-expand with negative suction. Recurrent pneumothoraces also need surgical attention for some permanent solution to the problem. With the recent upsurge of interest in minimal invasive thoracic surgery, advances in videoscopic technology, and thoracoscopic surgical equipment, more and more procedures are being carried out safely through key hole incisions. <sup>(10-13)</sup> Surgery for the primary pleural pathologies where a relatively

limited access would normally suffice, is the foremost and commonest indication. Inspection of lung and wedge excision from it, is another very common indication for thoracoscopic surgery, sparing the patient from the agony of post-thoracotomy pain. Inspection of pleural space was first described in 1910 by Jacobeous <sup>(14)</sup> when he used a cystoscope for the procedure. Since then direct vision thoracoscopy has regularly been used for inspection and biopsy of pleural, pulmonary and mediastinal lesions, staging of malignancies, and drainage of pleural fluids. However, because of restricted field of vision and limited access of instrument, the scope remained restricted. This paper describes our experience of 23 cases (Table 1). We have discussed various complications that occurred during this period and the modification in the procedure accordingly.

## PATIENTS AND METHODS

All patients were admitted a day before surgery. Informed consent was sought. Initial experimental nature of the procedure was explained and possible likelihood of open pleurectomy in case of unsatisfactory videoscopic result was mentioned. The surgery was performed under general anaesthesia in formal thoracotomy position with double lumen endotracheal tube in situ, to deflate the lung. Oxygen saturation was continuously monitored with pulse oximeter attached to a fingertip. Patient was painted and draped for a formal thoracotomy with full thoracotomy set at ready access. Three stab incisions were made in the anterior, middle and posterior axillary lines in the fifth intercostal space. 5 mm, 12mm and 7mm ports were

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introduced through the stabs respectively. The larger middle port was created to accommodate Endo GIA stapler (United States Surgical Corporation, Norwalk, CT) during the procedure and chest drain at the end. After the middle port was in place 0 degree telescope (Storz 260313) mounted on a video camera (circon 80-23 CCDV and Circon AACMI) Endovideo was inserted and a panoramic view of the lung and the chest wall was obtained. Having identified the pathologic area, lung was deflated, and other ports were introduced, under direct vision. Anterior Port accommodated a grasper, telescope was relocated through the posterior port and Endo GIA was forwarded through the middle port. Bullous area was stapled and withdrawn through the middle stab. After this stage we put back the telescope in the middle port. With the help of grasping forceps apical pleura was picked up and peeled away in a cork screw fashion with a gentle traction. Pleurectomy was carried out on the lateral chest wall as far low as possible usually around 5<sup>th</sup> rib. Anterior and middle ports were withdrawn, and a size 32 French chest drain was inserted through the middle stab. After satisfactory positioning of the drain, lung was re-inflated. Drain was attached to under-water seal suction of 25cms of water. As a rule the stab wounds did not need any stitches and the edges were approximated with steristrips. Post-op analgesia with morphine infusion (50 mgs in 50 mls N/Saline) for initial 24 hours was used.

## RESULTS

Altogether 21 patients were operated upon, for various indications (Table II). Individual surgical details are outlined in (Table II). Pleurectomy was performed in all. But bullous disease was not obvious in every case (n=18). No effort was made to actually isolate the point of air leak, but the bullous area was excised as a wedge. In patient no. 8 only pleurectomy was relied on. Our operation time ranged between 40 to 120 minutes with an average 70 minutes per case. The usual blood loss was between 30 to 150 mls in total except for one instance described below. In all but one case chest drain was removed in 1-2 days. However in patient no.8 prolonged air leak continued for two weeks, finally provocative-clamping<sup>(15)</sup> of the drain was successfully attempted and the drain was removed. Hospital stay in most cases was 3-4 days. But where we encountered any

complications the stay was prolonged.

## COMPLICATIONS

Among the 21 patient and 23 cases there were 7 morbid complications (Table IV). In three different instances patients had slight residual pneumothorax on the 2nd post-operative day. Each time a different trainee surgeon failed to spot the pneumothorax and the chest drain was removed. On two occasions the mistake was realised early and a repeat chest drain was inserted, while in the other instance patient was actually discharged from hospital. This patient represented 6 weeks later with a recurrent pneumothorax. Open pleurectomy was carried out this time. Patient no 12 developed traction neuroprexia of T1 root of brachial plexus. This led to paresis of ulnar nerve distribution. Possible reason for this complication was hyperabduction of the arm during the positioning for surgery. Nerve conduction studies were carried out which were normal. Patient was reviewed six weeks later in the outpatients with significant improvement of power and sensation. Patient no. 14 had excessive blood loss. During pleurectomy the pleura was noticed to be more vascular than normal. Blood loss during this procedure was 270mls. He continued to ooze from the raw area following the procedure. Apical chest drain failed to evacuate the blood. Suction to the drain was attached a little later. On routine post-operative chest x-ray the lung was collapsed and the hemithorax was nearly full of blood. Once the drain was irrigated and suction re-attached, blood started draining. The total drainage was 3 liters. The lung re-expanded with physiotherapy and chest drain suction. This patient needed four units of packed cells transfusion. Patient no. 21 had an attempted video-assisted pleurectomy, but due to some mechanical fault in the imaging equipment, picture resolution was unclear. It was felt safe to abandon the video-assisted procedure and to perform classical open pleurectomy.

## DISCUSSION

Until recently the treatment for spontaneous pneumothorax was either pleurodesis with various chemical agent, like fibrin glue<sup>(16)</sup>, Tetracyclines<sup>(17)</sup>, Iodized Talc<sup>(18)</sup>, and Silver nitrate<sup>(19)</sup>, or thoracotomy with bulla ligation / excision and pleurectomy. But now the trend is growing more in favour of some videoscopic solution. Although the recurrence recorded

Table - I

Pt.	No	Age	Sex	P.N.T.	S	C	A	COAD
1		40	F	1	R	+	-	-
2		29	M	1	R	-	-	-
3		20	M	2	R	+	-	-
4	(a)	17	F	2	R	-	-	-
	(b)			1	L			
5		35	M	2	R	+	+	-
6		40	F	3	R	+	-	-
7		37	M	1	L	+	-	-
8		77	M	1	R	+	+	+
9	(a)	18	M	2	L	-	-	-
	(b)			1	R			
10		39	F	4	R	+	-	-
11		47	M	3	R	-	-	-
12		23	M	3	L	+	-	-
13		17	F	8	R	-	-	-
14		17	M	3	L	-	+	-
15		40	F	3	R	+	-	-
16		16	M	1	L	-	+	-
17		35	M	4	L	+	-	-
18		16	F	10	L	-	-	-
19		23	F	10	R	+	-	-
20		50	M	1	R	-	-	-

P.N.T. = Pneumothrax number of times

S = Side of chest

C = Cigarette smoking

A = Asthmatic

COAD = Chronic obstructive airway disease

Table - II

Apical Bulla	Adhesions	Apical Fibrinous Patch	Procedure	Operation time, (in minutes)	Blood loss	Complications	Hospital stay
+	-	-	B+P	115	150	-	3 Days
+	-	-	B+P	90	100	-	2 Days
+	-	-	B+P	60	70	Reinsertion of chest drain	4 Days
+	-	-	B+P	70	80	-	4 Days
+	-	-	B+P	45	30	-	4 Days
+	-	-	B+P	75	90	-	2 Days
+	++	-	B+P+A	55	40	Reinsertion of chest drain	5 Days
+	-	-	B+P	50	35	-	2 Days
++	-	+	B+P	70	100	Prolonged air leak	14 Days
+	-	-	B+P	105	30	-	3 Days
-	-	+	P	50	Minimal	-	2 Days
++	-	-	B+P	50	80	-	3 Days
+	-	-	B+P	70	60	-	3 Days



by open thoracotomy is as low as 0.43%<sup>(20)</sup>; it is associated with higher morbidity in the form of post operative pain, consolidation of lung, basal atelectasis from pain and being in bed, and longer hospital stay. On the other hand videoscopic pleurectomy records a relatively higher recurrence<sup>(21)</sup> but the patient acceptability is high. The obvious advantages of videoscopic procedure are that the patient is spared from a rib spreading sore incision, post-operative recovery is quick and the hospital stay is short. Hence disturbance with daily work is minimal, and the final scar is much more acceptable (Fig. 1). Videoscopic thoracic surgery was only recently introduced in this department. It has provided us with an opportunity to learn and improve our technique. The complications we have reported from our experience were mostly avoidable and have certainly not recurred since we have

modified our technique of using a short chest drain, and applying negative suction to ensure lung expansion immediately after the procedure. The average hospital stay of our patients is four days. This is long probably due to the few complications and a patient with prolonged air leak. As all our patients get patient controlled analgesia of morphine sulphate, post-operative recovery is rapid and smooth. Our follow-up is very short and probably insignificant to draw any conclusions to recurrence, but we hold a firm belief that it will compare favourably to open pleurectomy. We conclude by saying that videoscopic pleurectomy is a quick, safe and effective procedure, because the morbidity is low, probably the indications for pleurectomy could be revised. More and more patients can be treated after first episode of pneumothorax rather than left to live with a dilemma of recurrence.

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