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# Clinical Records

# Vocal fold palsy due to plombage for tuberculosis

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**Abstract**
A 67-year-old patient, who had previously undergone Lucite ball plombage for pulmonary tuberculosis, presented with a hoarse voice, intermittent stridor and breathlessness. Direct laryngoscopy confirmed a left vocal fold palsy. A left supraclavicular mass became apparent and a computerized tomograph (CT) scan showed that a Lucite ball had migrated into her supraclavicular fossa. Subsequently she developed left arm pain and weakness. The balls were removed surgically, following which her arm symptoms improved but her voice remained unchanged. Migration of implanted material should be considered when new symptoms appear in patients who have undergone plombage treatment.

**Key words: Polymethyl methacrylate; Tuberculosis; Surgical Procedure; Vocal Cord Paralysis**

## Introduction

Closure of tuberculous cavities by collapsing the lung was an effective and widely employed treatment prior to the introduction of effective chemotherapy in the 1950s.[1,2] Artificial pneumothoraces, phrenic nerve crush and thoracoplasty were frequently carried out and, particularly between 1948 and 1955, plombage was increasingly employed. This involved introduction of material into the extra pleural space to collapse the lung. In 1953–54, 452 patients underwent plombage surgery in the UK.[3] Plombage treatment is known to cause several late complications[3] but the appearance of a left recurrent nerve palsy has not been previously reported.

## Case report

A 67-year-old female patient presented in October 1995 with a hoarse voice, intermittent stridor and increasing breathlessness on exertion. Direct laryngoscopy revealed a left vocal fold palsy with good compensation from the right fold. No other abnormality was seen.

The patient had developed extensive pulmonary tuberculosis, which was treated between 1948 and 1951 with bilateral artificial pneumothoraces and a pneumoperitoneum, and later by bilateral phrenic nerve crushes. In 1951 she underwent left-sided plombage with insertion of 11 Lucite balls followed by a left upper lobectomy in 1952 and a completion left pneumonectomy in 1953.

She received a course of para-aminosalicyclic acid (PAS), isoniazid and streptomycin between 1952 and 1954. Her tuberculosis has not subsequently relapsed.

She remained well until 1992 when she became gradually more breathless and then developed pneumonia requiring intubation and ventilation. She was extubated, but her arterial $PCO_2$ remained around 8 kPa during the day with a $PO_2$ of 5 kPa. Overnight monitoring showed a mean oxygen saturation of around 55 per cent, with elevation of her transcutaneous $PCO_2$. She was treated with domiciliary nocturnal nasal ventilation and her arterial $PCO_2$ improved to around 5.7 kPa with a $PO_2$ of 10 kPa.

In February 1997 she became aware of a sensation of fullness in the left supraclavicular fossa and on examination there was a palpable mass. Both internal and external jugular veins on the left were distended. A


Fig. 1
Computerized tomograph (CT) scan showing Lucite balls.

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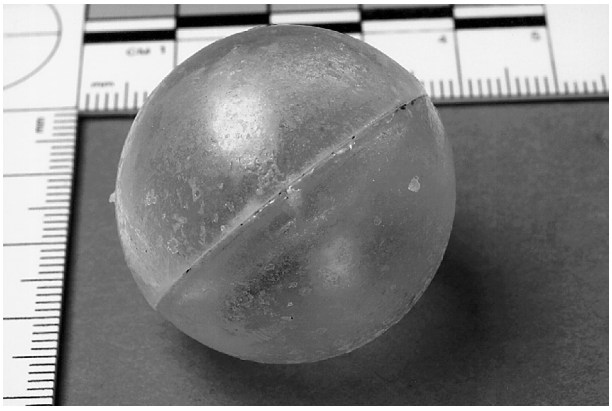

FIG. 2
Lucite ball after removal from patient.

computerized tomograph (CT) scan (Figure 1) confirmed that one of the Lucite balls had migrated into the supraclavicular fossa and others were eroding through the upper anterior intercostal spaces. She then developed pain and weakness in the left arm and shoulder and in June 1997 underwent a thoracotomy with removal of all 11 Lucite balls (Figure 2). She had no post-operative complications. There was some improvement in her upper limb symptoms but her voice remained hoarse and there has been no change in the character of her voice over the following seven years.

## Discussion

Collapse therapy by means of a thoracoplasty was developed in the early years of the 20th century but the removal of the ribs significantly disrupted the chest wall mechanics.[2] The use of plombage avoided this since the lung with the parietal pleura was stripped away from the chest wall, which was left intact, and material put into the extra pleural space (extra pleural pneumolysis). However, none of the plombage materials proved entirely satisfactory. Muscle flaps, paraffin, gauze, sponge, silk, wax, oils, gelatine and rubber balloons were all used. Balls made from methylmethacrylate (bakelite or Lucite), an acrylic resin, had the advantage of being lightweight, radiolucent and non-irritant and were the most widely used.[4]

Infection may appear in the extra pleural space after plombage[5,6,12] and occasionally malignancies including mesothelioma, sarcoma and squamous cell carcinoma, have been associated, probably as a reaction to the implanted foreign material.[7–9] Migration of the plombage material through the chest wall,[10,11] and into the oesophagus[12] has been recorded, and may also lead to a broncho-pleural fistula,[13,14] superior vena cava obstruction, erosion into the aorta[15] and compression of the brachial plexus.[3] Recurrent laryngeal nerve paralysis has not been previously observed.

- **Plombage is the treatment of tuberculosis by introduction of polymethyl methacrylate (lucite) into the extrapleural space in order to collapse the lung**
- **This treatment was in vogue from 1948 to 1955**
- **In this case report migration of a Lucite ball cranially resulted in a left vocal fold paralysis**
- **Treatment was by surgical removal of the Lucite balls via a thoracotomy**

The patient had noticed the change in her voice two years before the Lucite balls were palpated in her supraclavicular fossa and it is likely that they continued to migrate cranially during this interval. Involvement of the brachial plexus causing pain and weakness in her left arm and shoulder appeared after her recurrent laryngeal nerve palsy was detected. Surgery is almost always required when plombage material migrates and causes either symptoms or potentially serious complications.[5,12] Her symptoms from brachial plexus involvement improved slightly, although her voice remains unchanged.

Plombage therapy is very rarely carried out nowadays but there is a substantial cohort of patients who may present with late complications of this procedure. Migration of the material should be considered when otherwise unexplained symptoms appear. Surgical removal of the plombage material prevents further complications and may lead to symptomatic improvement.

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## References

1 Einstein HE. Out of the pages of history. *Chest* 2001; **120**:696–7
2 Shneerson JM. Respiratory failure in tuberculosis: A modern perspective. *Clin Med* 2004;**4**:72–6
3 Shepherd MP. Plombage in the 1980s. *Thorax* 1985; **40**:328–40
4 Wilson DA. The use of methyl methacrylate plombage in the surgical treatment of pulmonary tuberculosi. *Surg Clin* 1946;**26**:1060–70
5 Weissberg D, Weissberg D. Late complications of collapse therapy for pulmonary tuberculosis. *Chest* 2001;**120**:847–51
6 Wichmann M, Macha HN, Bas R, Hemer L, Zachgo W, Mikloweit P, *et al*. Treating plombage complication: Techniques available? *Chest* 1994;**105**:1622
7 Horowitz MD, Otero M, Thurer RJ, Bolooki H. Late complications of plombage. *Ann Thorac Surg* 1992;**53**:803–6
8 Ibarra-Perez C, Kelly-Garcia J. Lung carcinoma in a patient with Lucite sphere plombage thoracoplasty. *Chest* 1994;**105**:1622–3
9 Ibarra-Perez C, Kelly-Garcia J. More on thoracic neoplasms related to Lucite sphere plombage. *Chest* 1995;**107**:581–2
10 Openshaw PJM, Winterton SJ. Late results of plombage. *Thorax* 1986;**41**:494–5
11 Gunderman RB, Olak J, Jain M. Late extrusion of pulmonary plombage. *Chest* 1996;**109**:1103–5
12 Vigneswaran WT, Ramasastry SS. Paraffin plombage of the chest revisited. *Ann Thorac Surg* 1996;**62**:1837–9
13 Wood JB, Watson DCT. Sputum wax-worms after plombage. *Br J Dis Chest* 1988;**82**:321–3
14 Schmid FG, De Haller R. Late exudative complications of collapse therapy for pulmonary tuberculosis. *Chest* 1986; **89**:822–7
15 Ashour M, Campbell IA, Umachandran V, Butchart EG. Late complications of plombage thoracoplasty. *Thorax* **1985**;40:394–5

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