

Treatment of Pulmonary Tuberculosis with Thoracoplasty

as it Concerns the Nurse and the Physiotherapist

By

Mary John, B. SC. (HON.) N.

(Physiotherapist, Silver Jubilee T. B. Hospital, Delhi)

Introduction to the subject Tuberculosis

Tuberculosis is a very wide-spread disease, affecting not only human beings, but many species of animals, birds, and even fish (Human, Bovine, Avian & Piscine). Man is susceptible to the human and bovine types only.

Etiology

Age : No age is exempt, but the old are less likely to suffer. Tuberculosis of bones, joints, glands and serous membranes *e.g.*, peritoneum, meninges is commonest in children, while pulmonary tuberculosis is most often found in young adults.



Miss Mary John

Sex : The sexes are almost equally affected.

Occupation : Any occupation which lowers the resistance of the body,

predisposes to tuberculosis. People who work for long hours, the low income group, those who spend most of their time in ill ventilated rooms or insanitary surroundings, and those who are employed in trades which entail the inhalation of dust and irritating substances are more prone to infection.

Other Diseases : Catarrh, specific fevers, and any other diseases that lower the resistance of the body may lead to its development.

Two Main Pre-Disposing Causes

(i) Hereditary pre-disposition (diathesis). The disease itself is not inherited but the pre-disposition to contract it, is. This may generally be counteracted by living a hygienic and well regulated life, and keeping good health.

(ii) Lowering of body resistance due to malnutrition, debilitating diseases etc.

The mycobacterium tuberculosis is the causative organism. Infection may take place by (a) Inhalation (b) Ingestion or (c) Inoculation. The last rarely occurs except in the operation theatre or the postmortem room, resulting in a local lesion only.

Pathology

1. Formation of the tubercle.
2. Coalescence of tubercles and caseation.
3. Cavitation and/or fibrosis with or without calcification.

Phthisis or Pulmonary Tuberculosis

It may take one of two forms :

(i) *The acute form* : (Popularly known

as the galloping consumption) involving both lungs and usually ending fatally.

(ii) *The chronic form* : which is more common. It is, however, possible for chronic tuberculosis to undergo acute exacerbation.

Treatment

Aims of treatment in Pulmonary Tuberculosis

(a) Cavity closure (b) Sputum conversion.

To evaluate the result of treatment, cavity closure is more relied upon, since with the advent of antibiotics and chemotherapy, a negative sputum is more often seen even with a patent cavity.

In the modern treatment of chronic pulmonary tuberculosis, surgery is the main sheet-anchor. Surgical treatment may be (a) Collapse therapy or (b) rib resection. This article is mainly concerned with the collapse therapy, "Thoracoplasty with extra-fascial apicolysis."

Requirements of a Successful Thoracoplasty

1. A complete three dimensional collapse of the cavity (an uncollapsed cavity is a potential danger even when sputum is negative).

2. A selective collapse of the cavity because :

(a) Patients with pulmonary tuberculosis have a diminished respiratory function and therefore need to preserve as much healthy lung as possible.

(b) The other lung may be affected also when an extensive collapse of one side may exclude the possibility of bilateral collapse.

3. Operative risk must be small—not more than 1 to 3% mortality rate because a high operative risk makes the patient postpone the operation until too late.

The local treatment of pulmonary tuberculosis should result in an effective healing not only of the active destructive foci-producing bacilli, but also of the non-destructive infiltration thus forestalling its progression to active destruction. For the lesions in the upper and posterior

parts of the lung, thoracoplasty fulfils these requirements of local treatment in the majority of cases.

Advantages of Thoracoplasty

The main advantage of the modern thoracoplasty is that while it achieves a three-dimensional collapse of the cavity like the artificial pneumothorax, but unlike the latter it is a permanent, irreversible procedure and, being an extra pleural — extra fascial procedure, does not have its success jeopardised by the complications which often complicate A.P. (which is an intrapleural procedure).

The other great advantage is that the patient does not have to keep attending the clinic for years for refills, which has a bad psychological influence.

Disadvantages

The only disadvantage is the resulting deformity which occurs if proper pre- and post-operative physiotherapy is not given.

Deformity

The deformity complex after thoracoplasty without physiotherapy is :

(a) Deviation of the neck to the sound side.

(b) Scoliosis with convexity to the operated side in the thoracic region with compensatory convexity to the other side in the cervical and lumbar regions.

(c) The shoulder on the thoracoplasty side rises higher and protrudes forward.

(d) The hip on the sound side sticks forward.

(e) The patient puts more weight on the hip of the thoracoplasty side.

Physiotherapy

Patients requiring thoracoplasty operation need very careful training in posture, arm movements, and diaphragmatic and basal breathing. Many of these patients have had prolonged periods of bed rest (anything between a few months to a few years) and their posture therefore varies from slightly to decidedly poor. Re-education in posture and balance-sense needs therefore to be undertaken pre-operatively.

All thoracoplasty patients require a minimum of four to six pre-operative treatments. Those with a bad posture, poor breathing or difficulty in relaxing require longer treatment.

Posture Training. (i) Educate the patient in the simple good posture points to improve his sense of correct posture and balance, and to get him 'posture conscious'.

(ii) Teach him the corrective movements for any existing faults and for those likely to occur after operation. Existing faults are noted down on the Physiotherapy sheet.

Good Posture Points. (a) Hips on the same level, weight evenly taken.

(b) Shoulder-hip alignment; shoulder set squarely above the hips.

(c) Shoulders level with each other.

(d) Spine straight.

(e) Head and neck straight.

The patient should also be trained in relaxation, in order to overcome the post-operative tendency to keep certain muscles tight because of pain. This applies particularly to the neck and shoulder girdle muscles.

Probable Deformity After (say) Left Thoracoplasty:

Post-operative Physiotherapy

1st Day: (i) Correct posture to be

maintained in bed.

(ii) Diaphragmatic breathing exercise.

(iii) Patient helped to cough up sputum.

2nd Day: (i) Correct posture maintained.

(ii) Breathing and coughing exercise continued, and

(iii) Passive movements of the arm—abduction; adduction; rotation of the shoulder joint in the adducted and abducted positions and circumduction; all with the elbow bent and elevation of the arm; also bending and turning of the head to the operated side.

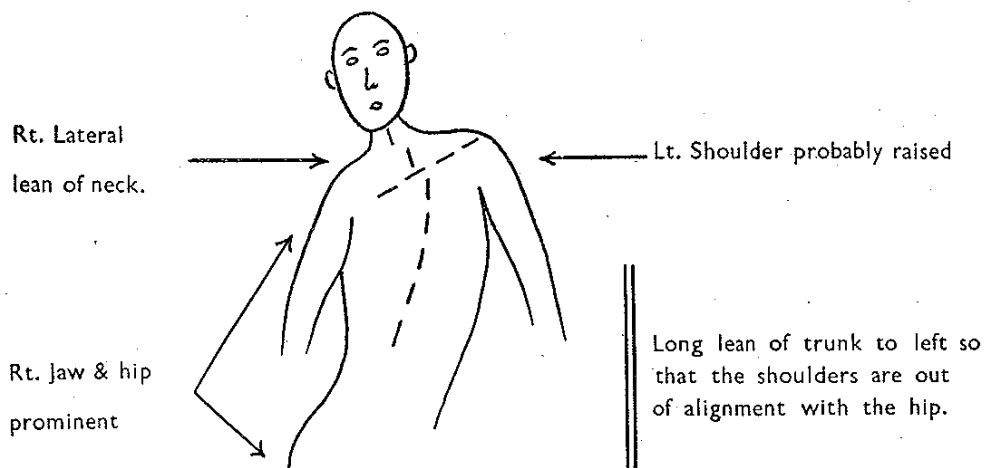
3rd & 4th Day: Routine of the 2nd day continued in bed.

5th Day onwards: If the patient's condition permits all these shoulder and neck exercises are done in front of a mirror, with the patient in the correct sitting posture.

Postural deformities may develop very rapidly, following the 1st stage of thoracoplasty. Those most likely to arise are shown in the diagram. The importance of correct posture while lying, sitting and standing and that of the pre- and post-operative physiotherapy cannot therefore be over-emphasized.

Nursing of Tuberculosis Patients

Nursing of tuberculosis patients is different from that in a general hospital



and has its special features. Tuberculosis patients stay in hospital for long periods, both before and after the operation. This prolonged stay, and the knowledge that the treatment is slow and the results labile and uncertain, creates a psychology which has been recognised and which needs a specialised approach both on the part of the doctor as well as the nurse. Many a patient, bored to distraction by what to him soon becomes a dull, drab, monotonous routine, a prolonged course of injections, pills and mixtures, lead to feelings of uncertainty about his future by guarded optimism or elusive replies of the doctor with regards to the results in his case; and should he be an earning member, driven into a state of mounting anxiety by his dwindling finances and the increasing fear of losing his job, he becomes reckless, rude, disobedient and problematic. It is under such difficult and tedious circumstances that the nurse is called upon to maintain her calm and composure, keep up an understanding and appreciative countenance, and exercise resolute patience obstinately refusing to be annoyed even by extreme provocations.

Ignorance or lack of appreciation of the simple rules of hygiene is in a great measure responsible for the spread of tuberculosis. The nurse is in an ideal position to educate the patient and his visitors on these rules *e.g.*, to always cough into a handkerchief or piece of cloth; to always spit into a covered receptacle; to always wash the hands well after attending to the patients; to always isolate the patient in the house as far as practicable and keep the room well-ventilated, paying particular emphasis on the point, that the proper way to protect the patient against exposure, is by adequately covering him and not by shutting all the doors and windows of his room.

On a patient's admission or transfer to the surgical ward, the well trained nurse, while sending information to the medical officer in-charge, also goes over the X-rays and laboratory reports accompanying the patient. She puts the new arrival on bed rest and starts off a fresh 4 hourly T.P.R. chart, pending the doctor's more

definite instructions. The new admission being a case for thoracoplasty is not an emergency. The doctor, therefore, may not visit the patient immediately on receipt of the information, he will probably see him at the time of his evening round or the next day. Hence the need for the nurse to proceed on with the above mentioned routine procedure without waiting for his instructions in each individual case.

Skin-preparation. From below the ears the whole of the back to the iliac crest; the front to the umbilical region; the arm, on the operation side to the elbow. We here, after soap and water cleaning, clean the part with turpentine and then Cetavlon 1% (*i.e.*, 75 parts of absolute alcohol plus 25 parts distilled water plus 1gm Cetavlon; then with spirit and cover with sterile towels.

Pre-medication. Luminol gr. 11 H.S.

Inj. Omnopon gr. 1/3.

Hyoscine Hydrobromide gr. 1/150, one hr. before operation.

Post-operative Nursing Care.

After the operation the patient is transferred from the O.T. to his bed which in our hospital, is taken into the operation theatre. The patient thus returns to the post-operative room lying in his own bed with an oro-pharyngeal airway *in situ* and oro-nasal B. L. B. mask with continuous oxygen running at 8-10 litres per minute, an intravenous drip of blood, or glucose and saline. With the modern advancements in anaesthesia the patient actually 'comes round' in the O. T. itself, responds when called by name and gives a cough when asked to. However, under the effect of Pethedine, he goes to sleep if left undisturbed, and it is in this condition that he returns to the post-operative room. He requires, therefore, the same treatment as an unconscious patient in shock would, and continuous vigilance by a nurse present in attendance all the time. The points to watch are:

1. **Position of the patient in bed:** The patient lies on his back with the arms lying at the sides or folded on the chest. Pressure on or stretching of the nerves of the arms must be avoided. The head

is turned to the operated side. Position of the legs must avoid pressure on the calf veins and on the tendo-achillis.

2. *Position of the bed.* The patient who has been in a head-low position on the operation table, and the patient suffering from circulatory depression, should maintain that position in bed as well, till the blood pressure has stabilised. In such cases the foot end of the bed is raised on blocks by 6 to 10 inches. After stabilisation of the B. P. the foot end of the bed is gradually lowered.

3. *Moving the unconscious patients:* Anaesthetised patients, and patients suffering from circulatory depression, stand moving badly. All movements should be smooth and gentle, not rough and jerky.

4. *Oxygen:* Continuous oxygen through an oro-nasal B.L.B. mask at not less than 8 to 10 litres per minute is kept up, even during the transit from the O. T. to the ward. The mask should fit effectively, when this is so, the rubber bag inflates and deflates incessantly with each respiration.

The patient retains the airway only for a short while. Soon he gives a cough and tries to pull the airway out. It should now be removed and the mark re-applied. The nurse should also know how to hold the lower jaw up of an unconscious patient to insure a good air passage.

5. *Prevention of paradoxical respiration:* (i.e., the reverse respiratory movements in that when the normal lung expands on inspiration the diseased part contracts and vice-versa during expiration).

(a) Careful staging of operation.

(b) The length and number of ribs resected is small at each stage.

(c) Not stripping the pleura anteriorly below the 2nd rib, nor laterally from the inner aspects of un-resected ribs, though it is stripped down as low as 7th rib posteriorly from in front of the body of the vertebra up to the angle of these ribs at the 1st stage itself.

(d) Proper strapping of chest-wall post-operatively.

(Contd. on page 192)

En Route to Rome



Miss E. H. Paull, President and Kumari Lakshmi Devi, General Secretary with members in Bombay who came to see them off at the Air Port,