A Case of Bulbar Poliomyelitis

BY

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The following are clinical notes on an interesting case of bulbar poliomyelitis with paralysis of the muscles of deglutition, but without involvement of the respiratory centre.

Illustrative Case

The patient, R.G., was a bright, intelligent girl of six years three months, who showed a very brave spirit throughout what must have been a prolonged, terrifying and intimidating experience.

16.12.55: She was admitted to hospital at 12 noon with history of anorexia for two weeks and of stiff neck and back, sore throat and difficulty in swallowing for four days. She had her tonsils removed by complete enucleation some months before and her mother had been a victim of poliomyelitis in childhood.

On Examination: She was calm and co-operative. The mouth was full of mucus which she attempted to swallow with difficulty and much effort. A sip of water was swallowed, but a second sip remained in the posterior pharynx; when she was asked to say "Ah," she gargled. There was no evidence of paralysis of the soft palate. There was stiffness and pain on terminal flexion of both neck and back.

There was no sign of respiratory failure, but there were rales in the hilar area which cleared on coughing.

The pulse rate was 120 per minute at rest. No loss of power in limbs was observed. Urination normal.

Reflexes:	*R.*	*L.*
B.	+	+
T.	+	+
S.	+	+
Abd.	+ /	+
	— /	—
K.J.	+	+
A.J.	+	+ (weak)
Planter	Equiv.	Equiv. (doubtful)
Nystagmus:	R + +	+ L.

A lumbar puncture was performed. Result: clear fluid under moderate pressure:—

C.S.F.—Cells—	
Leucocytes	57 per c.mm.
Erythrocytes	2 per c.mm.
No organisms.	
Chemistry—	
Chloride	780 mg.%
Protein	45 mg.%
Nonne apelt	weak
C.S.F. sugar	80 mg.%

At 4.30 p.m. the mucus appeared to be more sticky and more evident in the upper respiratory tract, otherwise ventilation reasonably good.

At 6.30 p.m. case seen by A.J.W.W. and J.M., when it was decided that the case be reviewed at 9.30 p.m., but in the meantime an anaesthetist (J.D.B.) be asked to stand by for possible tracheal intubation, etc.

"At 9.30 p.m., after further consultation (A.J.W.W., J.D.B. and J.M.), intubation was performed under general anaesthesia (Thiopentone, gas and oxygen, succinyl choline chloride and local Nupercaine), in order to obtain a clear airway and to exclude the aspiration of mucus. A rubber endotracheal tube was used. On carrying out tracheal toilet by suction through the endotracheal tube, first some vomit and then copious quantities of mucus were obtained from the bronchial tree.

"As anaesthesia passed off the child commenced 'bucking,' and it became obvious that in the conscious state she was unlikely to tolerate the endotracheal tube. However, it was also obvious that some method of sealing the lower respiratory passages from the pharynx and oesophagus was essential." (J.D.B.)

"It was considered that a tracheotomy was necessary and this was performed by J.R.R. At about midnight, under a second general anaesthesia and with local infiltration, a classical tracheostome was made. The thyroid isthmus having been divided, a tight-fitting cuffed tube fitted over a Jackson tracheotomy tube was inserted into the trachea and gave a tight seal without cuff inflation. It was the smallest improvised tube available, and at the time it was felt that it might be too tight a fit and was in danger of producing tracheal necrosis if left in too long. It was replaced as soon as possible (18.12.55) by a shortened endotracheal cuffed tube, but owing to lack of the correct bend this was later found to be causing some tracheal ulceration at the point of impingement and was changed for a silver tracheotomy tube (21.12.55), when the child was established in the postural drainage position." (J.R.R.) A clear airway and good ventilation was obtained forthwith. Suction was established to remove mucus in the mouth, hypopharynx and bronchial tree. A subcutaneous drip was set up with dextrose water and hyalase. Bicillin 1,200,000 units was given at once and repeated (300,000 units) daily.

17.12.55: The child had a restless night and paraldehyde was given. On auscultation the chest was apparently dry, breathing easy and she was able to expectorate mucus through the tracheotomy tube. There was no evidence of anoxia. However, in turning the child from right to left to examine the dependant lung, she coughed up a large quantity of mucus and blood, partially blocking the tracheotomy tube, and for hall an hour was quite distressed. (Pulse 146 and respiration 32 per minute).

She was placed in the postural drainage position with face down and changed from side to side at intervals of not more than half an hour. Frequent aspiration of nose and mouth (by one catheter) and tracheal tube (by another sterile catheter) was performed by the nursing sister in charge, with intervals of not more than 10 minutes. The drip was slowed down to 20 drops per minute and a close watch made for any sign of oedema.

18.12.55: A good night; less mucus. Some oedema of neck and slight surgical emphysema round the wound. Tongue and throat normal. Mucus membranes indicated full hydration, although only one vacolitre of dextrose water had been given in the 24 hours. This was now changed to glucose saline for a half vacolitre. J.R.R. removed the improvised Chevalier - Jackson - inside - the - rubber cuffed-endotracheal-tube and replaced the same with a foreshortened rubber cuffed endotracheal tube only. A Ryle's tube was inserted nasally and the subcutaneous drip discontinued.

Feeds were now possible and the following was used:

(1) A feed (P.E.D.—modified formula) consisting of potassium chloride 4.0 gram., casilan 80 gram., dextrose 150 gram., vit. syrup (Allenbury's) 40 drops, distilled water to 1 litre, divided into four-hourly feeds.

(2) Bengers and sod. chlor. to 2 oz. four-hourly, i.e., two-hourly alternately.

19.12.55: General condition very good; sleeping well. Patient now using the suction tube herself to extract mucus from her mouth and throat.

A milk and glycerine enema was given with bountiful results.

20.12.55: Improvement maintained, but it was noted that the patient was apprehensive when the aspiration catheter reached beyond the tracheal tube, suggesting inflammation and tenderness of the tracheal wall. Pot. iod. gr. ii b.d. was given in order to maintain a liquid consistency of the mucus, and a steam kettle was used as a humidifier.

21.12.55: As above, but at 6 p.m. patient complained of pain in chest.

On examination there was a suspicion of a small patch of atelectasis of the left lower lobe anteriorly, and the bronchial tree was bubbly. J.R.R. and A.J.W.W. came in consultation. The rubber tube was removed and an ordinary silver tracheotomy tube inserted by J.R.R. On careful examination of the tracheal wall, J.R.R. demonstrated that there was a small necrotic patch present, probably where the edge of the rubber tube had been biting into the tracheal wall. (A very soft and thin rubber cuffed tube made by Draeger of Lubeck has since been obtained from Germany.)

This change appeared to give definite relief and to assist with easier withdrawal of mucus.

Achromycin 100 mg. was given at once and repeated in four hours, and then six-hourly until the 27th.

22.12.55: The mucus was freer and thinner than formerly, but still sticky in the tracheotomy tube. Suction no longer caused pain. The above mentioned diet was successful in preventing wasting, dehydration or weakness up to the present.

23.12.55: Her chest condition and the mucus adhering to the tracheotomy tube appeared to be rather dry. The steam kettle was obviously not quite adequate as a humidifier. Alevaire was now tried and applied by an atomiser at frequent short intervals to the tracheal opening.

26.12.55: Since the use of Alevaire in an atomiser was introduced the secretion from the lungs became more fluid, easier to aspirate and also reduced in quantity. Ventilation good; some rhonchi now instead of rales.

She managed to swallow one mouthful of water, but succeeding attempts were unsuccessful.

27.12.55: Capable of swallowing small sips of liquid and jelly if administered slowly.

30.12.55: Tracheal tube removed; result satisfactory. Swallowing still slow and difficult.

2.1.56: Postural drainage position given up and patient propped up on three pillows; chest condition clear. Taking soft foods very well. Speech rather nasal. All drugs dispensed with.

4.1.56: Attempted walking with good results. Enunciation of words and sentences was practised with lip and mouth movements observed in a mirror. Nasal intonation steadily disappearing.

10.1.56: Discharged, fit and well; scar in neck quite small and nasal intonation hardly evident now.

DISCUSSION

The P.E.D. feed mentioned, consisting of potassium chloride, dextrose and casilan, was used in order to obviate any imbalance of the electrolytes, particularly potassium loss. This diet is recommended in "Diagnosis and Treatment of the Acute Phase of Poliomyelitis," [1] and Dr. J. S. Chudnoff [2] has demonstrated that "the severely ill poliomyelitis patient may suffer from complicating, serious and often fatal derangement of his body chemistry, viz., partially compensated respiratory acidosis, varying degrees of asphyxia, hypopotassemia, hypoproteinemia with reversal of the albumin/globulin ratio . . . to a point where oedema occurs . . ., hypochloremia, hypocalcemia and others of less clinical significance in maintaining life."

One lesson learnt in this case is that clinical estimation of the degree of mucus embarrassment in the respiratory system in bulbar poliomyelitis, even where respiratory paralysis is absent, may fall far short of actuality. In addition to what may collect in the bronchial tree, large quantities of fluid can collect in the hypopharynx with frequent aspiration into the lungs. In other words, one cannot trust one's clinical findings if one is to act in time.

"Difficulty or inability to swallow because of pharyngeal and palatal muscle weakness is rarely seen in any other infectious disease but poliomyelitis.* It is a significant diagnostic finding, carries with it a serious prognosis and provides certain definite indications for immediate therapy. Its early recognition and significance cannot be stressed too strongly." (W. P. Frank.)

"Cyanosis, the supposed telltale sign of partial asphyxia, may be conspicuous by its absence." (E. G. Knouf.)

The hazards of delay are that eventually the patient may drown in his or her own secretions.

"Ventilation meter studies disclose that postural drainage and oropharyngeal suctioning are inadequate to maintain a clear airway even in cases with minor involvement. Ideally, tracheotomy should be performed early, before clinical evidence of respiratory insufficiency or asphyxia is present, and certainly before aspiration of oropharyngeal secretions into the lungs has taken place. Delay in doing surgery either may be fatal or may ultimately produce pulmonary pathosis." (S. R. Cohen.)

This, indeed, is strongly emphasised by the team of experts of the "Communicable Diseases Unit" in California, which has dealt with some 18,000 cases, i.e., that it is better to perform a tracheotomy early, even in a doubtful bulbar

* Since writing the above a case of rabies exhibited exactly similar symptoms.

case, than delay and be too late. One may temporise with a dry bulbar case, but must act early with a wet bulbar. This latter is the view of Dr. A. J. W. Wilkins, who has seen many cases both here, in America and in the United Kingdom, and the treatment in this case is that which has proved to be life-saving elsewhere.

The principal lesson, however, and one which confirms the stipulations laid down by Dr. Wilkins in regard to the treatment of bulbar and respiratory cases in Salisbury, is that a team must be organised for assembly at short notice. This team should consist of an anaesthetist, an otolaryngologist, a physician, a suitable trained physiotherapist and, if available, a biological chemist. Last, but not least, a skilled conscientious nursing staff specialling the particular case for every minute of the 24 hours of the day is essential.

Had there been respiratory failure in the above-mentioned case this would have been dealt with by the use of a positive pressure breathing apparatus.

REFERENCES

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