

ACUTE GASTRIC DILATATION AS A RELATIVELY LATE COMPLICATION OF TETRAPLEGIA DUE TO VERY HIGH CERVICAL CORD INJURY

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Abstract. Patients sustaining an injury to the cervical spine at C_{3/4} level, with extensive cord damage, are difficult to manage. The injury is associated with a high mortality. The respiratory complications, including those associated with tracheostomy and intermittent-positive-pressure ventilation, are well recognised. The initial ileus and its management is also well documented. This report describes the development of acute gastric dilatation occurring 4 weeks after injury. The condition is particularly serious as many complications may have been overcome by this time resulting in a false sense of security. Two case histories are described. It is suggested that to a variable degree this complication probably occurs frequently in these patients. The aetiology of the acute gastric dilatation is discussed and recommendations are made (based on experience with one of the cases described), which may reasonably be expected to minimise the development and progress of the condition.

Key words: Acute gastric dilation; weaning from ventilator.

Case Summary I

On 22.11.78 a 16-year-old schoolboy was admitted with a fracture-dislocation at C_{3/4} as the result of a rugby accident. He had been supported by mouth-to-mouth ventilation initially and subsequently by intermittent positive pressure ventilation (IPPV) via a tracheostomy. Conservative management of his fracture-dislocation proved unsuccessful and open reduction with posterior wiring and fusion proved necessary. A gradually reducing regime of steroids was given over the initial 2 weeks. Five days after admission he was able to take a light diet and began to learn to breathe without the ventilator for gradually increasing periods.

Three-and-a-half weeks after admission he developed a constant discomfort in his right lower chest, though examination of chest and abdomen did not reveal any cause for this. Three days later he suddenly collapsed profoundly with a low B.P., rapid poor volume pulse and a markedly distended abdomen. No bowel sounds could be detected. Straight X-rays of his abdomen displayed the presence of acute dilatation of the stomach (see Fig. 1). A naso-gastric tube was passed which produced a large volume of gastric contents and gas. Rapid improvement in his condition followed. Bowel sounds returned after 24 hours but 6 days elapsed before he became independent of i.v. fluids. His serum amylase rose from 2000 to 7200 units (Normal range 700-1800 units), and then gradually fell during this episode.

Seven days later a further episode occurred though this was aborted early by the immediate passage of a naso-gastric tube. Both fluid and gas were again produced via the tube. The serum amylase again displayed a moderate rise during the episode.

Eight days later a further (though more mild), episode occurred, followed by another episode 1 week later.

As it appeared that he must be swallowing air (and it was felt reasonable from the point of view of management of his fracture), the patient was positioned more upright in

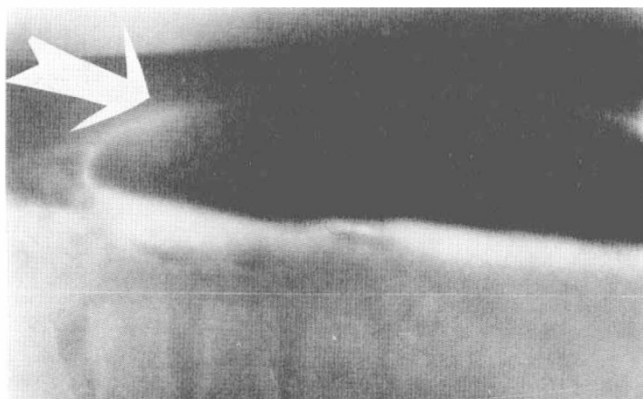


FIG. 1

bed, and the bed itself was tilted head-up to 15° —the maximum possible for the Stoke Mandeville electric bed.

The patient gradually increased his time off the ventilator and about 3 months after admission he slept for the first time without IPPV. Two further episodes of gastric dilatation occurred shortly after he became independent of the ventilator.

Case Summary II

A 15-year-old boy admitted with the same injury, also after a rugby accident, required IPPV via a tracheostomy. One month after admission, whilst making reasonable progress in becoming independent of the ventilator, he developed episodes of vomiting. Passage of a naso-gastric tube produced a large quantity of fluid and some gas. Unfortunately he subsequently developed respiratory complications which proved fatal.

Discussion

The neurophysiology of gastro-intestinal motility has been extensively studied (Bennett & Stockley, 1975). The initial ileus after a spinal injury is well recognised (Guttman, 1973). Two cases are presented, however, in which episodes of acute dilatation of the stomach occurred some four weeks after injury. During one of these episodes gastrograffin was passed into the stomach via the naso-gastric tube. It was found that no passage of the contrast medium into the duodenum occurred either with a 45° 'head-up' tilt or with added left-side-down attitude, the patient being unable to tolerate any further head-up tilt.

It was noted that, on each occasion that a naso-gastric tube was passed, a considerable volume of gas was obtained as well as fluid. It therefore appeared that air-swallowing was likely to have been responsible for these episodes. This seemed to occur when the patient was breathing independently. Aerophagy and gaseous distension are a potent cause of acute gastric dilatation (Birkhahn *et al.*, 1978; Wells *et al.*, 1961). The cases reported above suggest that some degree of acute gastric dilatation may well be a frequent occurrence in patients with very high cervical lesions when being weaned from IPPV. The condition can produce severe shock and an awareness of its potential frequency in these patients is obviously valuable. The complication is of course effectively managed by naso-gastric aspiration and suitable i.v. fluid replacement until return of normal gastro-intestinal motility. A 'head-up' tilt appeared to reduce the frequency and severity of the attacks.

The significance of the raised serum amylase during these episodes is uncertain. Many factors may produce a raised serum amylase (Salt & Schenker, 1976). We believe that in this case the elevated level was not the result of primary pancreatitis but was the result of a combination of at least the following factors:

- (a) Mechanical compression of the pancreas.
- (b) The presence of a degree of ileus.
- (c) Shock.

RÉSUMÉ

Les malades souffrant d'une lésion aux vertèbres cervicales, au niveau C_{3/4}, avec des dégâts étendus de la moelle, sont difficiles à soigner. La lésion est associée à une forte mortalité. Les complications respiratoires, comprenant celles associées à la trachéostomie et à une intermittente pression respiratoire positive sont bien reconnues. Il y a une bonne documentation aussi à propos de l'iléus initial et de son traitement. Ce rapport décrit le développement d'une dilatation gastrique aiguë apparaissant quatre semaines après la lésion. L'état est particulièrement sérieux comme beaucoup de complications peuvent avoir été surmontées à ce moment-là, ce qui pourrait résulter en un faux sentiment de sécurité. Deux cas sont décrits. Il est suggéré qu'il est probable qu'à un degré variable, cette complication apparaît fréquemment chez ces patients. L'étiologie de la dilatation gastrique aiguë est discutée et des recommandations sont faites (basées sur l'expérience de l'un des cas décrits) qui minimiseront vraisemblablement le développement et les progrès de l'état.

ZUSAMMENFASSUNG

Patienten, die eine Verletzung der Halswirbelsäule in Höhe von C_{3/4} erleiden, zusammen mit einer ausgedehnten Rückenmarkschädigung, sind schwierig zu behandeln. Diese Verletzung ist oft mit einer hohen Mortalität verbunden. Komplikationen der Atmungsorgane, einschliesslich der Komplikationen verbunden mit einer Tracheotomie und der künstlichen Beatmung, sind allgemein bekannt. Der anfänglich auftretende Ileus und seine Behandlung sind auch oft beschrieben worden. Dieser Bericht befasst sich mit der Entwicklung einer akuten Magenerweiterung, die vier Wochen nach der Verletzung auftrat. Dieser Zustand ist besonders ernst, da viele Komplikationen zu diesem Zeitpunkt bereits erfolgreich behandelt wurden und dadurch ein falsches Sicherheitsgefühl vermittelt wird. Zwei Fälle werden beschrieben. Es wird allgemein angenommen, dass diese Komplikation oft bei diesen Patienten eintritt. Die Ätiologie der akuten Magenerweiterung wird beschrieben und Therapievorschlüsse gemacht (auf Grund der gesammelten Erfahrungen in der Behandlung einer der Fälle), von denen man erhoffen kann, dass sie die Möglichkeit der Entwicklung und des Fortschreitens dieses Zustandes verringern.

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