

CASE REPORT

Paediatric trauma with hyperamylasemia

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Accepted 18 September 2015

SUMMARY

In this case report, we describe a paediatric case of hyperamylasemia following parotid trauma. A 12-year-old boy was hit by a motorcycle, sustaining only superficial lacerations to the face overlying the parotid. A hyperamylasemia was noted, and further characterised by a fractionated isoamylase test, as being predominantly of the salivary type. Serum lipase levels were low. Based on these investigations, pancreatic injury was judged unlikely with the minor parotid trauma being the probable source of the hyperamylasemia. The patient was spared further unnecessary investigations and managed conservatively.

BACKGROUND

This case illustrates the diagnostic conundrum faced by clinicians when presented with a hyperamylasemia that could be the result of a number of pathologies and injuries, making a clear diagnosis of parotid trauma in a child with potential concomitant organ damage problematic. It highlights the value of a fractionated isoamylase test and serum lipase to rule out pancreatic and visceral injury before resorting to investigations that would subject the patient to ionising radiation or more invasive testing.

CASE PRESENTATION

A 12-year-old boy, while crossing the road, was struck on his right side by a motorcycle travelling at 20–30 mph. In the emergency department, he was managed as per advanced trauma and life support protocol. The only abnormalities detected were seemingly benign, superficial lacerations to the face (figure 1) and an amylase of 760 U/L on the day of admission. He did not report abdominal pain and, on examination, his abdomen was soft and non-tender. There was no loss of consciousness and no features of a head injury.

INVESTIGATIONS

To rule out pancreatic injury (and an unnecessary CT scan), a fractionated isoamylase test was performed the following day. The total amylase was 287 U/L, 23 pancreas-specific and 264 salivary-specific. Serum pancreatic lipase levels were low at 23 U/L.

A maxillofacial review was not clinically suspicious of any damage to the structure of the parotid that would require imaging.

DIFFERENTIAL DIAGNOSIS

Initially, the finding of hyperamylasemia in this patient was concerning for:

1. Pancreatic trauma
2. Hollow viscus trauma
3. Head injury
4. Shock

The lack of abdominal pain and signs was reassuring, however, concern about an occult visceral or pancreatic injury in a child warranted further investigation of the hyperamylasemia. Head injury was ruled out as the cause, by a lack of clinical signs or neurological deterioration over the observation period. The patient was not shocked and lactate levels were not raised on admission.

TREATMENT

The patient was managed conservatively and had an uneventful observation period of 2 days in hospital.

OUTCOME AND FOLLOW-UP

Pancreatic and visceral injury was judged to be unlikely based on biochemical and physical examination findings. As the facial injuries were superficial and there was no evidence of a collection or damage to any structures within the parotid, further imaging was judged unnecessary. The amylase levels were reducing prior to discharge.

DISCUSSION

Hyperamylasemia can be the result of a number of pathologies and traumatic injuries; the critical question in this case surrounded the possibility of injury to the abdominal viscera. Conflicting accounts exist regarding the utility of amylase assays in the trauma setting, some studies of paediatric trauma patients suggest that hyperamylasemia is infrequent and poorly predictive of visceral injury,¹ and serum levels are likely to resolve in 24 h.² Conversely, sustained increases in amylase and lipase levels have



Figure 1 Superficial lacerations to the face, overlying the parotid.



To cite: Boam T, Durell J, Dagash H, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-211271

been described as a reliable predictor of pancreatic injury when imaging is unavailable.³

A fractionated isoamylase test may be requested to differentiate between the various sources of the enzyme; the pancreatic and salivary types are the most important. The test is not available in most National Health Service (NHS) laboratories, however, it is quickly and easily obtained by sending a serum sample to the biochemistry department at King's College Hospital in London, where daily assays are performed at a cost of £23.10 each. While the pancreatic isoamylase is relatively specific for pancreatic pathology, it is also known to be increased in bowel injury and infarction due to reabsorption from the lumen.⁴

Salivary isoamylase is not specific to the salivary glands. A hyperamylasemia where this isoform is dominant may also be seen in postoperative states, renal failure (due to impaired clearance),⁴ head trauma,⁵ and in critically ill and shocked patients.⁶ Clearly, in this case, given the raised salivary isoamylase, some of these differential diagnoses would have demanded

consideration in the presence of indicative clinical signs or more serious injuries.

A raised serum amylase level is a well-documented finding in significant parotid injuries,⁷ however, performing a fractionated isoamylase test is advisable to confirm the source.⁸ In this case, the elevated salivary isoamylase with the clinical finding of lacerations on the face implied the hyperamylasemia was due to parotid gland trauma, despite the superficial nature of the injuries themselves. Visceral injury was deemed improbable due to a lack of abdominal signs in the context of low pancreatic isoamylase and lipase levels.

Contributors TB wrote the article and conducted the literature review. JD, HD and AR assisted with writing, provided revisions and performed some literature review as well as selecting and managing the case in question.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Learning points

- ▶ Superficial parotid injuries are sufficient to raise serum amylase.
- ▶ When hyperamylasemia is associated with trauma it is necessary to ascertain the cause.
- ▶ Fractionated isoamylase and lipase are an alternative to CT scanning for potential pancreatic/visceral injury.
- ▶ Correct interpretation of serum amylase levels in conjunction with clinical findings is of particular importance in paediatric trauma where patients are more vulnerable to the effects of ionising radiation from potentially unnecessary scans.

REFERENCES

- 1 Capraro AJ, Mooney D, Waltzman ML. The use of routine laboratory studies as screening tools in pediatric abdominal trauma. *Pediatr Emerg Care* 2006;22:480–4.
- 2 Keller MS, Coln CE, Trimble JA, et al. The utility of routine trauma laboratories in pediatric trauma resuscitations. *Am J Surg* 2004;188:671–8.
- 3 Mahajan A, Kadavigere R, Sripathi S, et al. Utility of serum pancreatic enzyme levels in diagnosing blunt trauma to the pancreas: a prospective study with systematic review. *Injury* 2014;45:1384–93.
- 4 Pieper-Bigelow C, Strocchi A, Levitt MD. Where does serum amylase come from and where does it go? *Gastroenterol Clin North Am* 1990;19:793–810.
- 5 Vitale GC, Larson GM, Davidson PR, et al. Analysis of hyperamylasemia in patients with severe head injury. *J Surg Res* 1987;43:226–33.
- 6 Kameya S, Hayakawa T, Kameya A, et al. Hyperamylasemia in patients at an intensive care unit. *J Clin Gastroenterol* 1986;8:438–42.
- 7 Westreich M, Binns JH. Posttraumatic parotid pseudocyst with hyperamylasemia. *Plast Reconstr Surg* 1982;69:1002–6.
- 8 Goyne WB, Alexander JM. Use of fractionated amylase to distinguish between pancreatic and parotid injury: report of cases. *J Oral Surg* 1980;38:522–4.

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