Cure of hyperparathyroidism in pregnancy by sternotomy and removal of a mediastinal parathyroid adenoma

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Summary
Primary hyperparathyroidism is rarely reported during pregnancy but can cause significant maternal and neonatal morbidity. We report a case of hyperparathyroidism during pregnancy requiring mediastinal sternotomy for resection of a mediastinal parathyroid adenoma. Surgery resulted in normalisation of serum calcium, resolution of symptoms, and prevented neonatal hypocalcaemia.

Keywords: hyperparathyroidism; mediastinal adenoma; pregnancy

Primary hyperparathyroidism is infrequently reported during pregnancy. The incidence of hyperparathyroidism in women of childbearing age is approximately eight cases per 100 000 per year, yet in a recent review of the literature only 109 cases during pregnancy were reported between 1930 and 1990. Untreated hyperparathyroidism may have serious consequences for both mother and child and surgical removal of the parathyroid tumour during pregnancy may be required. Identification and removal of a hyperfunctioning parathyroid tumour, including most mediastinal tumours, can usually be accomplished by cervical exploration. Occasionally, because of their deep location in the chest, median sternotomy is necessary.

Case report
A 31-year-old woman presented in August 1995 with abdominal pain. Serum calcium was 2.70 mmol/l (normal range 2.10–2.57 mmol/l) and serum parathormone 60 pg/ml (10–50 pg/ml). There was no family history of hypercalcaemia. Four weeks later the patient discovered that she was pregnant and further investigation was deferred. In November 1995 (at 14 weeks gestation) she was admitted to hospital with nausea, vomiting and abdominal pain. Serum calcium had increased to 2.93 mmol/l, phosphate was 0.96 mmol/l (0.81–1.55 mmol/l) and alkaline phosphatase 52 U/l (35–120 U/l). Urinary calcium excretion was elevated, 18.8 and 20.0 mmol/24 h on two occasions (3.0–9.0). Serum parathormone remained inappropriately elevated at 38 pg/ml. Serum immunoglobulin electrophoresis pattern, angiotensin-converting enzyme and amy-
Conversely, after delivery, when the maternal transplacental supply of calcium ceases, neonatal hypocalcaemia becomes the major problem. This may occur because the neonate is unable to mobilise calcium stores adequately as a result of prolonged parathyroid gland suppression.

Up to 40% of inferior parathyroid glands lie within the thymus gland, and as most are located in the cervical tongue of thymus, they are surgically accessible from the neck. Overall, less than 2% of parathyroid adenomas require sternotomy for removal and approximately 50% of these will be intrathymic. Our patient is the first reported case of hyperparathyroidism during pregnancy who required mediastinal sternotomy for successful retrieval of the hyperfunctioning tumour. Some difficulty was encountered in localising the adenoma because radioisotope techniques are contraindicated during pregnancy. Ultrasonography has proved useful in identifying parathyroid adenomas in the neck but cannot localise tumours within the mediastinum. Experience with MRI is still limited and although the presence of an intrathymic lesion was suggested using this technique, it could not be confirmed as a parathyroid tumour. Improved resolution was achieved by means of a short CT scan with dynamic (helical) enhancement.

Retrospective case reviews suggest that foetal and neonatal complications are more common in medically managed cases and that maternal morbidity from neck exploration surgery is low. In particular, successful surgery eliminates the risk of neonatal hypocalcaemia. Median sternotomy to remove a mediastinal parathyroid adenoma will tend to be associated with higher morbidity than cervical exploration. In a series of 38 patients from the Mayo Clinic who underwent median sternotomy for removal of a parathyroid adenoma, 21% had postoperative chest complications. Although our patient subsequently developed a pulmonary embolus, it was felt that in the presence of persisting hypercalcaemia and significant symptoms, formal mediastinal exploration was warranted.

Learning points

- Hyperparathyroidism during pregnancy can cause significant medical problems for both mother and child.
- Total serum calcium normally falls as pregnancy progresses so that hypercalcaemic symptoms may be experienced at lower total serum calcium levels than usual.
- In hyperparathyroidism, parathormone is not always increased but should be inappropriately high for the serum calcium concentration.
- A helical CT scan is helpful in mediastinal parathyroid adenoma localisation, especially during pregnancy when radioisotope techniques are contraindicated.
- Parathyroidectomy during the second trimester of pregnancy effectively prevents neonatal hypocalcaemia.

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