

Parathyroid cyst: a rare cause of an anterior neck mass

BHAL CHANDRA JHA, M.S.*, NITIN M. NAGARKAR, M.S., D.N.B.*, SUMAN KOCHHAR†, HARSH MOHAN, M.D.‡, ARJUN DASS, M.S., D.N.B.*

Abstract

Parathyroid cysts are rare. Most of them present in the anterior neck as cystic neck swellings. A case of cervical parathyroid cyst is presented, along with a brief review of the literature regarding the aetiology, clinical features, diagnosis and management of this condition.

Key words: Parathyroid glands; Cysts; Neck

Introduction

Parathyroid cysts are uncommon. In spite of their presentation as a neck mass, there is a paucity of description about this entity in otolaryngological literature. We recently encountered a female having a parathyroid cyst in the neck. The case is reported along with a brief review of the literature. The purpose of this report is to make the otolaryngologist aware of this entity as a cause of an anterior neck mass.

Case report

A 35-year-old female, presented in the ENT out-patient department with a five-month history of painless swelling in the left lower part of the neck. The swelling had been gradually increasing in size and was not associated with dysphagia, hoarseness or dyspnoea.

Physical examination revealed a cystic, non-tender, fluctuant 4 × 3 cm mass in the region of the left lobe of the thyroid gland. The surface of the mass was smooth and it moved with deglutition. There were no other abnormal

physical findings. Routine haematological biochemical investigations were normal. Thyroid function tests were also normal. A clinical diagnosis of left lobe thyroid cyst was made. Colour doppler sonography of the thyroid gland (Figure 1) revealed a clear cyst of 3.5 × 2.5 cm diameter near the lower pole of the left lobe of thyroid gland. Fine-needle aspiration from the swelling yielded a clear, thin, straw-coloured fluid and cytology was reported as a benign thyroid cyst.

The patient was planned for elective surgical excision of the cyst. Surgical exploration of the neck revealed a thin-walled, 4 × 3 cm single cyst attached to the lower pole of thyroid on the posterior aspect. The cyst was easily separated from the thyroid and surrounding tissue. The rest of the thyroid gland was normal. The left recurrent laryngeal nerve was identified and preserved. A suction drain was placed and the wound closed in layers. The post-operative period was uneventful. Histopathological examination of the cyst revealed a cyst wall composed of fibro-adipose tissue containing islands of parathyroid tissue. The cyst was lined internally by cuboidal epithelium (Figure 2). Subsequently, the patient's blood was sent for

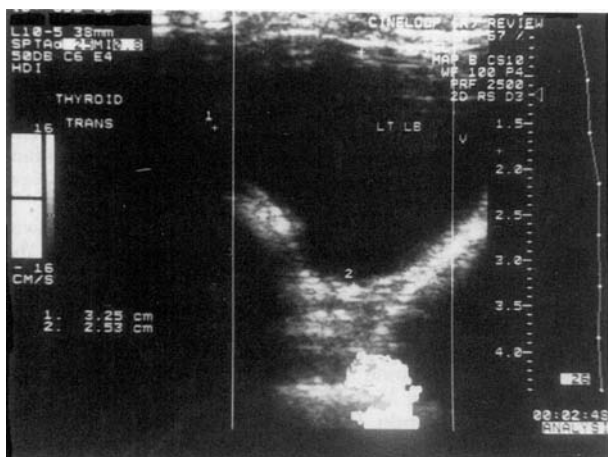


FIG. 1

Colour doppler ultrasound scan of transverse section of thyroid shows a clear cyst near lower pole of left lobe of thyroid gland.

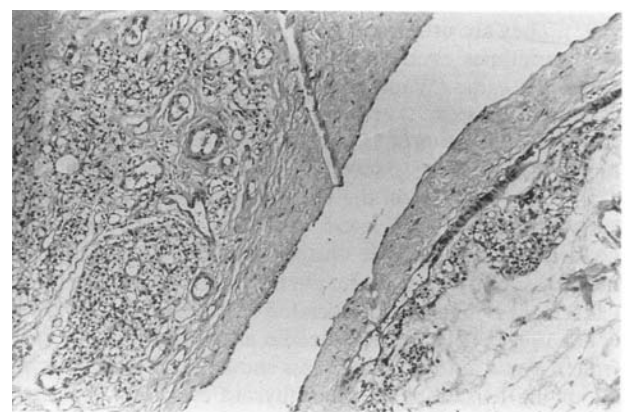


FIG. 2

Photomicrograph of the cyst wall showing inner lining by cuboidal epithelium while the cyst wall contains islands of parathyroid tissue (H & E; × 100).

From the Departments of Otolaryngology*, Radiodiagnosis† and Pathology‡, Government Medical College Hospital, Chandigarh, India. Accepted for publication: 10 November 1998.

determination of serum calcium, phosphorus and parathyroid hormone, the values of which were found to be within normal limits.

Discussion

Parathyroid cysts are rare clinical and pathological entities. Until 1996, only approximately 200 cases had been reported in English literature (Alvi *et al.*, 1996). The majority of them present as neck swellings but a small number of cases presenting as mediastinal masses have been reported (Gurbuz and Peetz, 1996; Landau *et al.*, 1997).

In Rosenberg *et al.*'s (1982) review of 14 cases, parathyroid cysts represented 0.6 per cent of all thyroid and parathyroid surgical specimens examined over a 15-year period. Calandra *et al.* (1983) found 11 cases of parathyroid cysts in 325 patients who underwent parathyroid operation. Pacini *et al.* (1985) suggested that the true incidence is much higher. They performed fine-needle aspiration on 112 consecutive patients with anterior neck masses. Seven patients (6.2 per cent) were found to have parathyroid cyst as determined by hormone analysis.

The pathogenesis of these lesions is not clear. Mallette (1994) has proposed the following classification of parathyroid cysts based on the presumed origin.

- (1) *Ontogenous* – a result of the vestigial remnant of the parathyroid primordials cells of the third or fourth branchial pouches.
- (2) *Coalescent* – these are defined as developing from coalescence of areas of cystic degeneration in the normal gland or an adenoma.
- (3) *Pseudocysts* – are the result of cystic degeneration of an adenoma.

On the basis of electron microscopic analysis of a cyst, Troster *et al.* (1978) concluded that the parathyroid cysts originated from the third pharyngeal pouch. It is quite probable that cysts may result from any of the above mechanisms.

Most of the cervical parathyroid cysts usually occur in females between 20–60 years of age (Gordon and Harcourt-Webster, 1965; Calandra *et al.*, 1983; Landau *et al.*, 1997). They usually arise from the inferior parathyroid gland and frequently present as fluctuating neck masses in the anterior part of the neck (Okamura *et al.*, 1992). They are usually diagnosed clinically as thyroid cysts and sometimes even fine-needle aspiration cytology may reveal the same (Wang *et al.*, 1972; Leurd *et al.*, 1996).

Most of these cysts are reported as non-functioning as in our case. In a series of 11 cases, Calandra *et al.* (1983) have found that 10 were associated with hyperparathyroidism. There are examples in the literature in which parathyroid cysts have been associated with hyperparathyroid crisis (Albertson *et al.*, 1981; Gurbuz and Peetz, 1996). Fine-needle aspiration is a useful means to diagnose these cysts. Clear fluid is invariably associated with these cysts (Turner *et al.*, 1989). Thus the fine-needle aspiration of clear fluid from a cystic anterior neck mass should alert the physician about the feasibility of a parathyroid cyst. The aspirated fluid should be sent for estimation of parathormone and thyroglobulin content. High parathormone and low thyroglobulin in the fluid confirms the diagnosis (Turner *et al.*, 1989). According to Silverman *et al.* (1986) the C-terminal/mid-molecule determination should be the assay of choice because N-terminal specific assay can give rise to a false negative result.

The treatment of parathyroid cysts is by aspiration and/or surgical excision. Since these cysts have a tendency to recur after aspiration, surgical excision is required in the majority of these cases. Wang *et al.* (1972) summarized the characteristics of these cysts during surgery as:

- (a) The cyst is usually loosely attached to the thyroid with a definite cleavage plane.
- (b) A cyst with a whitish, tough membrane wall containing clear, watery fluid.
- (c) A low lying position of the cyst in the neck.

All these intra-operative findings were seen in our case.

The other method of treatment suggested by Okamura *et al.* (1992) is sclerotherapy using tetracycline. Wakabayashi *et al.* (1995) share a similar view for the treatment of non-functioning cysts.

Acknowledgements

The authors would like to thank the Director Principal and the Medical Superintendent of the Government medical college hospital, Chandigarh for granting permission to use the hospital records.

References

- Albertson, D. A., Marshall, R. B., Jarman, W. T. (1981) Hypercalcemic crisis secondary to a functioning parathyroid cyst. *American Journal of Surgery* **141**(1): 175–177.
- Alvi, A., Myssiorek, D., Wasserman, P. (1996) Parathyroid cyst: current diagnostic and management principles. *Head and Neck Surgery* **18**(4): 370–373.
- Calandra, D. B., Shah, K. H., Prinz, R. A., Sullivan, H., Hofmann, C., Oslapas, R., Ernst, K., Lawrence, A. M., Paloyan, E. (1983) Parathyroid cysts: A report of 11 cases including two associated with hyperparathyroid crisis. *Surgery* **94**(6): 887–892.
- Gordon, A., Harcourt-Webster, J. N. (1965) Parathyroid cyst – a report of two cases. *Journal of Pathology and Bacteriology* **89**: 374–377.
- Gurbuz, A. T., Peetz, M. E. (1996) Giant mediastinal parathyroid cyst: an unusual cause of hypercalcemic crisis – case report and review of literature. *Surgery* **120**(5): 795–800.
- Landau, O., Chamberlain, D. W., Kennedy, R. S., Pearson, F. G., Keshavjee, S. (1997) Mediastinal parathyroid cysts. *Annals of Thoracic Surgery* **63**(4): 951–953.
- Leurd, K. S., Tabbara, S. O., Delvecchio, D. M., Frost, A. R. (1996) Cytomorphology of cystic parathyroid lesions: report of four cases evaluated preoperatively by fine needle aspiration. *Diagnostic Cytopathology* **15**(4): 306–311.
- Mallette, L. E. (1994) The functional pathological spectrum of parathyroid abnormalities in hyperparathyroidism. In *The Parathyroids: Basic and Clinical Concepts*. (Bilenzikian, J. P., Marcus, R., Levine, M. A., eds), Raven Press, New York.
- Okamura, K., Hioroshi, I., Sato, K., Yoshinari, M., Nakagawa, M., Kuroda, T., Fujishima, M. (1992) Sclerotherapy for benign parathyroid cysts. *American Journal of Surgery* **163**: 344–345.
- Pacini, F., Antonell, A., Last, R. (1985) Expected parathyroid cysts diagnosed by measurement of thyroglobulin and parathyroid hormone concentration in fluid aspirates. *Annals of Internal Medicine* **102**: 793–794.
- Rosenberg, J., Orlando, R., Ludwig, M., Pyrttek, L. J. (1982) Parathyroid cysts. *American Journal of Surgery* **143**: 437–480.
- Silverman, J. F., Khazanie, P. G., Norris, H. T., Fore, W. W. (1986) Parathyroid hormone assay of parathyroid cysts examined by fine needle aspiration biopsy. *American Journal of Clinical Pathology* **86**(6): 776–780.
- Troster, M., Chiu, H. F., McLarty, T. D. (1978) Parathyroid cysts: report of a case with ultrastructural observations. *Surgery* **83**: 238–242.

- Turner, A., Lampe, H. B., Cramer, H. (1989) Parathyroid cysts. *Journal of Otolaryngology* **18(6)**: 311–313.
- Wakabayashi, K., Takahashi, T., Tejima, S. (1995) Parathyroid cyst (Japanese) *Nippon Rinso-Japanese Journal of Clinical Medicine* **53(4)**: 1004–1007.
- Wang, C., Vickery, A. L., Maloof, F. (1972) Large parathyroid cysts mimicking thyroid nodules. *Annals of Surgery* **175(3)**: 448–453.

Address for correspondence:
Dr Arjun Dass,
Professor and Head,
Department of ENT,
Government Medical College Hospital,
Sector 32,
Chandigarh-160047
India

Fax: +91 172 608488/609360