Plasma cell granuloma of the thyroid

K W CHAN, G P POON,* C H CHOI

From the Department of Pathology, University of Hong Kong, Hong Kong, and the *Government Surgical Unit, Queen Mary Hospital, Hong Kong

SUMMARY A thyroid nodule comprised numerous polyclonal plasma cells inside cellular fibroblastic stroma, with residual thyroid tissue in the centre of the nodule. There was no associated paraproteinämia. The residual thyroid tissue suggests that the exuberant granulation tissue in this case represents an unusual reaction to a colloid nodule. As far as we know, this is the first adequately documented case of the so called plasma cell granuloma of the thyroid.

Plasma cell granuloma occurs in the lungs, less commonly in the stomach, and rarely in liver, retroperitoneum, kidney, spinal meninges, tonsil, bladder and pancreas. The lesions are non-neoplastic, tumour like, and composed principally of plasma cells within a fibrous stroma. The distinction of plasma cell granuloma from plasmacytoma has been based essentially on morphology. More recently, immunohistochemical techniques have been used to distinguish between the two lesions.

Plasma cell granuloma of the thyroid is very rare. We recently found such a case, the clinical and pathological features of which form the basis of this report. The features we found suggested that the lesion had originated from a colloid nodule.

Case history

A 35 year old Chinese woman complained of a lump in the right side of her neck. Physical examination showed a firm nodule 3 cm in diameter in the right lobe of the thyroid. She showed no toxic signs, and a thyroid function test showed normal thyroxine concentration. A radiograph of the neck showed slight compression on to the trachea by the nodule. Calcification was absent.

Right hemithyroidectomy was performed and a request for frozen section diagnosis was made. A tentative diagnosis of plasma cell granuloma was considered. Subsequent investigations showed absent antithyroglobulin and antimicrosomal antibodies in her blood. No circulating light chains or other para-proteins were found on serum electrophoresis and immunoelectrophoresis. Serum immunoglobulins were within normal range, and no haematological or biochemical abnormalities were detected. The patient was well two months after the operation.

Pathology

The surgical specimen was a right lobe of thyroid that measured $5 \times 3.5 \times 3$ cm. A well circumscribed white round nodule was visible on the anterolateral surface of the gland near the isthmus. The nodule measured 3 cm in diameter (fig 1). There was an eccentrically placed area of 2 cm in diameter of light brown colloid tissue. The thyroid parenchyma outside the nodule seemed to be normal.

Microscopically the peripheral white area of the nodule was found to be composed of aggregates of plasma cells forming clumps within cellular fibrous tissue (fig 2) in which a small number of atrophic...
thyroid acini were trapped. These acini were focally infiltrated by plasma cells (fig 3). Lymphocytes and polymorphs were few in number. The central area of thyroid tissue resembled a colloid nodule. The adjacent thyroid parenchyma showed focal lymphocytic infiltration that was practically absent in the thyroid tissue further away from the nodule. Hürthle cells were absent.

Fig 2 Low magnification photomicrograph of nodule showing moderately cellular fibroblastic tissue in which clumps of plasma cells are found. At this low magnification, clumps of plasma cells appear as patches of darkly stained granules. Both fibroblastic tissue and clumps of plasma cells are forming whorls around residual thyroid tissue in centre of nodule, shown on left hand side of photomicrograph. (Haematoxylin and eosin.) × 28.

Fig 3 Some atrophic thyroid acini trapped in fibroblastic tissue. Note close relation between plasma cells and follicular cells. There is no Hürthle cell change. (Haematoxylin and eosin.) × 550.

Formalin fixed paraffin embedded sections of the lesion were stained for κ and λ chains using the three step immunoperoxidase technique. The monoclonal antibodies were supplied by Dakopatts, Denmark. The presence of the light chains was recognised by intense dark brown colouring in the cytoplasm. The staining pattern was polyclonal with those plasma cells positive for λ chains slightly outnumbered by those positive for κ chains (figs 4 and 5).

Discussion

The occurrence of plasma cell granuloma of the thyroid could be traced back to as early as 1957, when a non-neoplastic plasma cell granuloma in the thyroid of a 41 year old woman was seen by Hepinstall and was subsequently cited by Ackerman and Rosai.11 The present case, as far as we know, is the first adequately documented plasma cell granuloma that has occurred in the thyroid. Plasma cell granuloma has been found in several sites in the body. The lungs1 and the stomach2,3 are the commonest sites; the tonsil8 and the bladder9 are rarely affected. Antigenic stimuli and pathogens from the outside world have easy access to these four organs. The retroperitoneum,5 liver,4 kidneys,6 pancreas,10 and thyroid11 are rarely affected sites and are much less exposed. The thyroid nodule in this patient was not subjected to any invasive investigations such as drill biopsy or aspiration cytology, which are often performed for managing solitary thyroid nodules.

Like the plasma cell granulomas in other sites, the lesion has no apparent association with infections. A
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Fig 4 Immunoperoxidase staining for λ light chains. Plasma cells containing λ light chains are darkly stained and are individually scattered among many plasma cells that are not stained. (Immunoperoxidase) × 275.

Fig 5 Area stained for κ light chains. Plasma cells positively stained are more numerous than those positive for λ light chains. (Immunoperoxidase) × 275.

case of coexisting carcinoma and plasma cell granuloma of the stomach has recently been reported.3 The cause of plasma cell granuloma remains unknown. In this case the thick band of granulation tissue that formed the nodule had all the histological features of plasma cell granuloma. The residual thyroid tissue in the central area of the nodule showed the changes of a colloid nodule. While occasional thyroid nodules have a mild peripheral lymphoplasmacytic cellular infiltrate, the formation of such plasma cell rich exuberant fibrous tissue as a reaction to the nodule must be very exceptional, and it seems unjustified to conclude that the infiltrate was necessarily a reaction to the colloid nodule in this case. Having found no evidence to suggest other possible causes for the lesion, we prefer to regard it as plasma cell granuloma rather than merely as a colloid nodule with an exaggerated plasma cell reaction.

The thyroid gland is rarely affected in multiple myeloma and plasmacytomas.12 Difficulty may arise in distinguishing plasmacytoma, a neoplasm of the plasma cells, from plasma cell granuloma, by morphology alone. The lack of cellular pleomorphism and the rich fibroblastic cellular stroma are useful features in favour of the latter diagnosis. Recently, immunohistochemical techniques have been used to show the polyclonality of plasma cells13 14 for confirming a diagnosis of plasma cell granuloma.2 This technique was also used in this case to confirm the diagnosis that was first made based on the morphological appearance in frozen section.

References


Requests for reprints to: Dr KW Chan, Department of Pathology, University of Hong Kong, Hong Kong.