A NEUROFIBROMA MIMICKING A PAROTID GLAND TUMOR BOTH CLINICALLY AND BY SCANNING

Robert H. Wilkinson, Jr. and Jack K. Goodrich

Duke University Medical Center, Durham, North Carolina

The detection of intrinsic salivary gland disease and tumors by imaging the salivary glands after the intravenous injection of ^{99m}Tc-sodium pertechnetate has been described by several investigators (*1–7*). In general the tumors have presented as localized regions of decreased or apparently absent tracer activity when compared with the remainder of the salivary glands. An exception to this "cold" tumor scan appearance has been the Warthin's tumor (papillary cystadenoma lymphomatosum). Grove and DiChiro (*3*) and Stebner et al (*4,5*) have reported greater concentration of ^{99m}Tc-pertechnetate in a Warthin's tumor when compared with surrounding normal salivary gland tissue. Thus when imaged this tumor presents as an area of relatively increased tracer activity. Grove and DiChiro (*3*) have reported one parotid carcinoma which apparently concentrated ^{99m}Tc-pertechnetate.

The relative nonspecificity of tumor localization of ^{99m}Tc-pertechnetate within cerebral abnormalities including neoplasms is well recognized. Extracranial tumor accumulation of this tracer has also been reported in several different neoplasms in various regions of the body (*8*).

This communication describes a case in which both the pre-operative clinical and scan findings indicated the presence of a parotid mass but subsequent surgical excision of the mass revealed an unexpected pathologic entity.

CASE HISTORY

A 59-year-old female was admitted to the Duke University Medical Center with a 3-year history of a palpable mass in the left parotid region. During the year preceding her hospital admission, the mass had enlarged but remained painless except when the patient had a "cold in her ear." The admission physical examination revealed an 8 × 8-cm oval, firm, nontender mass in the region of the left parotid gland. There were no palpable lymph nodes. The remainder of the history and physical examination were noncontributory. The clinical impression was that of a benign parotid mixed tumor. A salivary gland scan was requested.

Following the intravenous injection of 1 mCi of ^{99m}Tc-sodium pertechnetate, the lower head and upper neck were scanned in the anterior, and left and right oblique projections with a Picker V Magnascanner (Fig. 1A, B, C). At the conclusion of each scan image, the mass was outlined on the teledeltos paper "dot" scan and the outline of the mass was subsequently transferred to the photoscan with crayon. The anterior photoscan (Fig. 1A) revealed a normal right parotid gland and submaxillary glands. The left parotid gland appeared enlarged, with the mass apparently lying within or at least contiguous with the gland. The tracer activity recorded within the mass and gland appeared greater than that in the right parotid gland. The mass was believed to represent a salivary gland tumor or unilateral hypertrophy with hyperactivity. Based on available reports in the literature, the possibility of a Warthin's tumor or parotid carcinoma was discussed at the time of the scan interpretation. It was elected to surgically excise the tumor.

Immediately before surgery the patient received 1 mCi of ^{99m}Tc-pertechnetate intravenously. At surgery a well-encapsulated, reddish mass was found superimposed posteriorly ("below") and adjacent to the parotid gland. A branch of the facial nerve appeared to penetrate the mass over its anterior surface. The frozen section performed at the time of surgery was interpreted as a "neurolemmoma." The facial nerve was identified only in part as the mass was surgically extirpated. It was elected to perform

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For reprints contact: Robert H. Wilkinson, Dept. of Radiology, Div. of Nuclear Medicine, Duke University Medical Center, Durham, N.C. 27706.

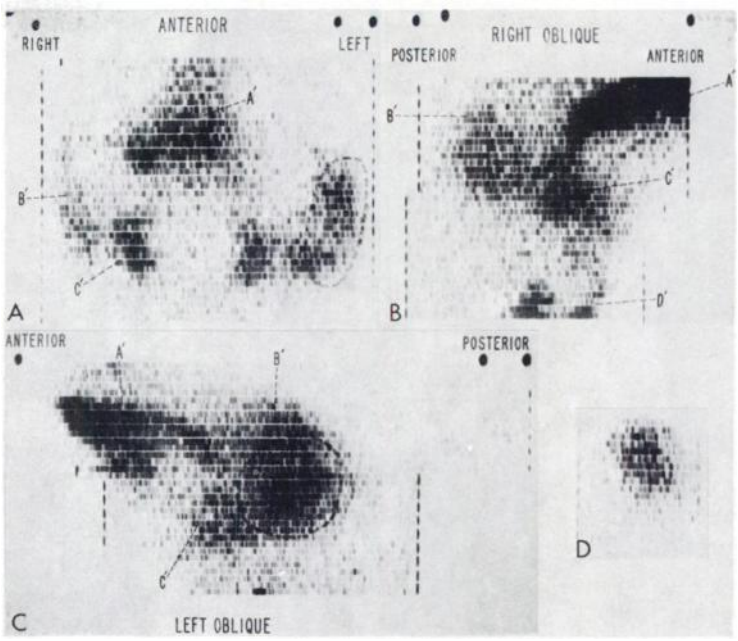

FIG. 1. Anterior, right oblique, and left oblique rectilinear salivary gland scans are illustrated in A–C. Area outlined by dashes in A and C delineates palpable mass. A′ shows oral cavity; B′, parotid gland; C′ ,submaxillary gland; and D′, thyroid gland. D is rectilinear scan of surgically excised neurofibroma.

a rhytidectomy in the event that there had been facial nerve injury during the surgical procedure. A very small biopsy specimen of parotid gland was taken and the wound was closed. The resected tumor was scanned with a rectilinear scanner (Fig. 1D) and a small section of tumor was removed for scintillation well counting. The specimen was then sent to the Surgical Pathology Department for definitive sections.

The tumor and parotid gland sections were approximately the same size and weighed 0.369 and 0.414 gm, respectively. Each specimen was carefully placed at the bottom of a counting test tube and counted in a scintillation well counter. The results were expressed as the counting rate per milligram of tissue. The tumor tissue was recorded as 84 cpm/mg of tissue, and the salivary gland tissue was recorded as 228 cpm/mg of tissue.

The final pathologic diagnosis was reported as a "neurofibroma with cystic degeneration."

Postoperatively the patient exhibited some left facial nerve paralysis. She was also found to have a cardiac arrhythmia, but this did not significantly affect her recovery. She was discharged with residual minimal left facial nerve paralysis. A followup, postoperative scan revealed a significant decrease in the area and degree of tracer activity at the site of the tumor when compared with the previous study.

DISCUSSION

The pre-operative physical examination revealed a parotid gland mass, and the clinical impression was that of a parotid gland tumor. A benign parotid mixed tumor was the primary clinical consideration. This tumor has been described as showing decreased to absent tracer accumulation when scanned (*3–5*). One case in Grove and DiChiro's series of four mixed tumors resulted in a normal parotid gland scan (*3*). The salivary gland scan study in this case report did nothing to lessen the clinical impression of an intrinsic parotid gland mass but suggested a different parotid tumor. The anterior scan view (Fig. 1A) revealed that the tracer activity within the region of the left parotid gland was significantly greater than that in the right parotid gland. It was presumed that this represented either parotid gland tumor tracer accumulation or conceivably parotid gland hypertrophy. In light of the literature, the parotid tumors considered were a Warthin's tumor or a carcinoma (*3–5*). Grove and DiChiro reported a "hot" tumor scan in the only Warthin's tumor scanned in their series (*3*). Stebner et al report that in their series, only two Warthin's tumors were scanned and these were "hot" tumors (*5*). Grove and DiChiro report six carcinomas scanned following the injection of ^{99m}Tc-pertechnetate (*3*). This series of six carcinomas consisted of one neoplasm which accumulated tracer ("hot" tumor), two neoplasms without tumor accumulation of tracer but abnormal parotid gland contour or position, and three neoplasms which did not accumulate tracer and did not distort the gland.

Contrary to both the clinical and scan impressions, the tumor was found to be a neurofibroma arising from a branch of the left facial nerve. Grove and DiChiro have written that "space-occupying masses may, however, if of sufficient size and if located within or adjacent to the glands, produce in the scan a salivary gland defect or displacement. Several 'cold'

tumors in our series caused such changes in the salivary scans" (*3*). In this study the tumor, which was adjacent but extrinsic to the parotid gland, did not produce a "cold" tumor but appeared as a "hot" tumor. The tissue sections, the postresection scan of the tumor, and the comparison of the pre- and post-salivary gland scans indicate the presence of tracer activity within the mass. The tumor tissue section counting rate per milligram of tissue in contrast to the comparable value derived from the salivary gland tissue would suggest that there was less tracer in the tumor.

Although additional views might have distinguished between the tumor and the normal salivary gland, this is unlikely in view of their anatomical relationship. The appearance of tracer activity within the neurofibroma, while unexpected, should not be too surprising in retrospect (*8*).

SUMMARY

A case report is presented in which the superimposition of a tracer accumulating neurofibroma and normal salivary gland led to an erroneous clinical and scan impression of a tracer accumulating parotid tumor or unilateral hypertrophy. This possibility should be kept in mind in the evaluation of tracer accumulating parotid tumors identified on salivary gland scans.

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