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Post Fine Needle Aspiration Cytology Infarction of Invasive Encapsulated Follicular Variant of Papillary Carcinoma of Thyroid- Report of a Rare Occurrence

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ABSTRACT:
Fine needle aspiration cytology(FNAC)is convenient and inexpensive and very rarely leads to complications. Infarction is one such rare Complication due to the trauma induced by the needle passage into the tissue. Infarction in tissue can occasionally cause problems in the histological assessment of the thyroid nodules. The incidence of infarction may vary from 0% to 10%.

About 60% of thyroid nodules are classified as benign, 30% are classified as indeterminate and the remaining 10% are classified as malignant in the FNAC cytology reports using Bethesda system. Surgical excision of thyroid gland is advised for patients who have malignancy or suspicious malignancy report by FNAC.

It has been reported that the occurrence of post FNAC infarction is in the Thyroid tumors only and observed mostly in Hurthle cell tumors followed by papillary carcinomas and Follicular carcinomas.

Pathologists have divided the follicular variant of papillary carcinoma(FVPTC) into non invasive(EFVPTC) and invasive(I-FVPTC) according to the presence or absence of capsule and /or vascular invasion.

Invasion rather than nuclear features drives the outcome in encapsulated follicular tumor.We present here possibly the first case of invasive encapsulated follicular variant of papillary carcinoma of thyroid which has undergone near total infarction following FNAC procedure two weeks before.

Key-words:FNAC , FOLLICULAR VARIANT, INFARCTION, PAPILLARY CARCINOMA

Key Messages: Infarction of Thyroid neoplasms after FNAC is a very rare complication and It can be difficult to make histological interpretation of thyroid tumors if the infarction is near total. The morphology of cells in the viable tissue will help to make a satisfactory diagnosis in those cases.

I. INTRODUCTION:

Fine needle aspiration cytology(FNAC) is a highly useful procedure in the clinical management of the thyroid nodules. The trauma induced by the needle passage can rarely lead to tissue alterations of varying severity. Infarction is one such rare tissue change that can cause problem in the histological assessment of Thyroid nodules.[1-4]The incidence of infarction post FNAC may vary from 0% to 10%[2].

About 60% of thyroid nodules are classified cytologically as benign using Bethesda system on FNAC material. About 30% are indeterminate and 10% are classified as malignant.[5] Surgical excision of thyroid gland is advised for patients who have malignancy or suspicious malignancy report by FNAC.

It has been reported that post FNAC infarction occurs only in thyroid tumors and is observed mostly in Hurthle cell tumors followed by papillary carcinomas and Follicular carcinoma. [6,7]We present here possibly the first case of post FNAC near total infarction in an invasive encapsulated follicular variant of papillary carcinoma of thyroid.

II. CASE HISTORY:

A 40 year old female attended the surgical Outpatient department with the complaints of painless swelling in front of the neck of one and a half year duration.Examination revealed a swelling of size 4x6cms in the lower part of the neck more on the right side.The swelling was moving with the deglutition. There were no other significant findings on the clinical examination.She gave a history of FNAC done on a swelling in the neck which was reported as Papillary carcinoma at some other hospital in 2018..

During the general check up and investigations she was detected to have an old lesion of Pulmonary tuberculosis.

She was admitted with the clinical diagnosis of solitary thyroid nodule. Ultrasound examination revealed well circumscribed echoic lesion with calcific foci in the right lobe of thyroid.

FNAC of the right lobe thyroid nodule suggested Follicular variant of Papillary carcinoma(Figure.1)

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Total thyroidectomy was done and the specimen was sent for histopathological examination.

The thyroidectomy specimen measured 4x5x6cms.The right lobe was enlarged and a single nodule of size 1.5x2.5cms was seen. Rest of the thyroid was unremarkable. Cut surface of the right lobe showed a well circumscribed nodule of size 1.5x2cms with dark brown granular surface(Figure.2)

Rest of the thyroid was unremarkable.

Histopathology of the nodule showed a tumor which was almost totally infarcted with a rim of viable tissue at the periphery(Figure.3)

The necrotic centre also showed ghost shadows of follicles (Figure.4)

Tiny calcific foci were seen in this viable area and necrotic central area. The tumor in the viable area was seen forming follicles of variable size. The cells lining these follicles were polygonal with round ground glass nucleus. Nuclear grooves were seen in some and some had prominent nucleolus. Overlapping of these cells were seen at places (Figure.5) There were foci of through and through capsular penetration by the tumor (Figure.6)

Basing on the nuclear morphology, architecture, follicular pattern and capsular invasion, a diagnosis of invasive encapsulated follicular variant of papillary carcinoma is made.

After one month of surgery, I-131 whole body scintigraphy was done which showed no evidence of RAI avid tissue in thyroid bed or functional metastases else where in the body.

III. DISCUSSION:

FNAC is a safe,convenient and inexpensive procedure that is highly useful in the management of thyroid nodules. Surgical excision of thyroid gland is the treatment of choice for patients who have malignancy or suspicious malignancy report on FNAC. The trauma induced by passing needle into the tissue during FNAC can lead to variably severe changes in the tissue. Infarction is one such rare complication in the tissue which can cause problems in the histological assessment of thyroid nodules.[1] Infarction can be partial , near total or total.

Us-Krasovec etal [2] did not report any case of infarction in 305 post FNAC thyroidectomies studied.

Kini et al [6] reported 1.4% cases of infarction in their 1150 thyroidectomies studied.

Gorden et al [8] reported varying degree of infarction in the thyroid when the surgery was performed with in 3 months of FNAC, with high rate of 9.8%.

It has been an interesting observation that the occurrence of post FNAC infarction has been in the neoplastic thyroid tissue only. Total or near total infarction has been observed mostly in Hurthle cell tumors of thyroid after FNAC.[6,7,8] Of the 28 cases of post FNAC infarction in thyroid neoplasms reported by kini et al [6] 15 were Hurthle cell tumors(53%) 8 were Papillary carcinomas(28%) and 5 were Follicular carcinomas(18%).

Our case invasive encapsulated follicular variant of papillary carcinoma is possibly the first case to undergo infarction post FNAC.

Infarction is usually manifested as replacement of viable tissue with necrotic debris surrounded by a rim of granulation tissue and a few viable cells.Three patterns of post FNAC necrosis in thyroid nodules is described: central necrosis with viable periphery, wedge shaped or triangular necrosis and total necrosis of the entire lesion. In the first two patterns it is usually possible to correctly classify the lesion by evaluating the residual viable portion.[4] In the present study the infarction showed central necrosis with a thin rim of viable tissue in the periphery that helped in making a histopathological diagnosis with some confidence.

The follicular variant of papillary carcinoma(FVPTC) is composed mostly of follicles with tumor cells having the features of papillary carcinoma.The tumor capsule in this variant has been considered as a very important feature to subdivide into Encapsulated FVPTC (EFVPTC) and infiltrative FVPTC (IFVPTC). Pathologists have divided the EFVPTC into non invasive and invasive(I-FVPTC) according to the presence or absence of capsule and /or vascular invasion.[9] Invasion rather than nuclear features drives the outcome in encapsulated follicular tumor.[10]

FVPTC consists of different subgroups with varying pathological and clinical features. There is increasing evidence that non invasive FVPTC has a favorable clinical behavior.Invasive FVPTCs are associated with both regional and distant metastasis, recurrent disease and even death.[11].

Our case is an example of invasive encapsulated follicular variant of Papillary carcinoma. The tumor had undergone near total infarction and the viable tissue in the periphery of the tumor showed morphological features of papillary carcinoma. There was evidence of capsular invasion at places and foci of calcification. This is probably the first case of Invasive

encapsulated follicular variant of papillary carcinoma to undergo near total infarction after FNAC.

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