Materials and Methods
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The proposed study was carried on 40 patients with nodular thyroid disease referred for gray scale sonography and Color Doppler sonography from various OPD’s and wards of Pt. B.D.Sharma PGIMS Rohtak, to the department of Radiodiagnosis. Clinical history of every patient was taken. General physical, systemic and local examination of every patient was carried out as per proforma attached. Relevant laboratory investigations were done.

Sonographic examination was performed with Logiq-400 / Logiq-500 (wipro GE) scanner using a broad band (6-13 MHz) linear array transducer for real time B-scan imaging which automatically switches to 6.7 MHz for Color Doppler study. Patients were examined in supine position with extended neck obtained by placing a pad under the shoulders.

Real time gray scale ultrasonography was done first and the following characteristics were evaluated in thyroid nodules:

1. Size
2. Consistency
3. Margins
4. Sonographic texture i.e. echogenicity of the nodule with respect to surrounding thyroid parenchyma
5. Presence of calcification and its nature (microcalcification was taken as hyperechoic spots ≤ 2mm without acoustic shadowing)
6. Presence and characteristics of the peripheral halo (transonic rim surrounding thyroid parenchyma)

7. Extrathyroidal involvement in the form of lymph node enlargement or invasion of anatomical surrounding structures

Color Doppler imaging was performed under standardized settings for maximum Doppler sensitivity (lowest velocity scale and lowest filter settings). The angle that gave the strongest signal was retained for the rest of study. The Color Doppler imaging results were classified with regard to absence or presence and distribution of color flow into three patterns:

1. Type I – absence of color flow
2. Type II – mainly peripheral flow
3. Type III – mainly intranodular flow

Spectral analysis was performed on every vascular nodule. Peak systolic velocity (S), end diastolic velocity (D) and resistance index (RI) were also calculated [RI = S-D/S].

The findings of both gray scale and Color Doppler sonography were recorded in the proforma attached. The results were correlated with the final diagnosis established by FNAC / histopathological examination.

Statistical evaluation of significance was performed using chi square test.