There are many different features indicating a certain benign or malignant tumor type, but many of these are overlapping signs. Combining several features is considered to give the best result. Ultrasound features of benign lesions are often described as a diffusely enlarged gland, a well-circumscribed inhomogeneous hyper- or isoechoic solid lesion, a semi-solid or predominantly cystic lesion, multinodular lesions, and so forth. US features suggestive of malignant thyroid tumors have been described as follows: microcalcifications, hypoechogenicity, a taller than wide lesion, predominantly solid composition, irregular borders, absence of peripheral halo, intranodular hypervascularity, and regional lymphadenopathy [4,8,9]. No single US feature has both a high sensitivity and a high positive predictive value for thyroid carcinoma. The different malignant tumors have to some degree a different appearance on US.

“Comet Tail” Crystals

![“Comet Tail” Crystals](image)

Figure 2-1. “Comet tail” crystals are highly echogenic, tiny, almost shiny foci, often with white tails, seen within both solid and cystic lesions that represent condensed colloid [4,6,7]. The white tail is a result of reverberation artifacts. A, Cystic colloid nodule. B, Papillary thyroid carcinoma.
Calcifications are described as micro-, coarse, or “eggshell” calcifications.

**Microcalcifications**

![Images of calcifications with annotations A through F.]

**Figure 2-2.** Microcalcifications are defined as punctate, highly echogenic, but somewhat pale nonshadowing discrete foci. They are thought to represent calcified psammoma bodies or granular amorphous deposits of calcium [4,10]. If they are innumerable or located in small groups, the tumor is highly suspicious for being a papillary carcinoma. Microcalcifications are also seen in medullary carcinoma, but they tend to be more coarse and with more irregular shape than in papillary carcinoma [6,7,10]. Often a few microcalcifications are also found in other malignant and benign tumors. A. Papillary thyroid carcinoma (PTC), innumerable. B. PTC, clusters. C–E. PTC. F. Medullary thyroid carcinoma.