

Management Strategies for Thyroid Colloid Cysts

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Abstract:

Background: Thyroid colloid cysts are common benign thyroid lesions that are frequently detected incidentally during ultrasonographic examination. Although most cysts remain asymptomatic and require only observation, intervention may be necessary in patients with compressive symptoms, cosmetic concerns, progressive enlargement, or suspicious imaging features. Simple aspiration is commonly used as an initial treatment; however, it is associated with high recurrence rates due to reaccumulation of cystic fluid. Minimally invasive techniques, including ethanol ablation, radiofrequency ablation, and intralesional triamcinolone injection, have therefore emerged as alternatives to repeated aspiration and surgery. Triamcinolone has anti-inflammatory, antiproliferative, and antifibrotic effects that may reduce cyst volume and limit fluid recurrence by decreasing capillary permeability, suppressing epithelial proliferation, and promoting fibrosis of the cyst wall. Available evidence suggests that intralesional triamcinolone injection is a safe, effective, and minimally invasive treatment with few adverse effects and no consistent significant impact on thyroid function. Nevertheless, further large-scale randomized controlled studies are required to establish standardized treatment protocols and assess its long-term efficacy. Thyroid colloid cysts are benign degenerative lesions that usually require conservative follow-up. Symptomatic or recurrent lesions may require aspiration, ablation, or surgical treatment. Because recurrence after simple aspiration is common, increasing attention has been directed toward minimally invasive therapies, particularly intralesional triamcinolone injection, as a potential method for reducing cyst size, relieving symptoms, and preventing recurrence while avoiding the risks of surgery.

Keywords: Thyroid colloid cyst; Triamcinolone; Intralesional injection; Ethanol ablation; Radiofrequency ablation; Minimally invasive treatment; Thyroid nodule.

Introduction:

Colloid cysts in the thyroid are benign degenerative lesions that typically require observation alone unless they cause compressive symptoms, cosmetic concerns, or demonstrate suspicious features warranting tissue diagnosis. Initial Diagnostic Approach Ultrasound is the only appropriate initial imaging modality for characterizing thyroid colloid cysts, providing superior visualization compared to CT or MRI. High-resolution ultrasound can differentiate benign from malignant nodules and detect lesions as small as 5mm (1).

Management Algorithm Based on Cyst Characteristics. Purely Cystic Thyroid Lesions (<10% Solid Component), for thyroid nodules that are almost entirely cystic, simple needle aspiration is considered the initial management approach, particularly in symptomatic patients. This procedure serves a dual purpose by providing diagnostic confirmation while also achieving temporary symptomatic relief through fluid evacuation.

However, recurrence following aspiration is common, with reported rates ranging from 50% to 80%, limiting its role as a definitive treatment. In cases of recurrent cystic lesions, ethanol ablation (EA) is recommended as the preferred minimally invasive therapy, demonstrating significantly higher efficacy and lower recurrence rates compared to repeated aspiration procedures (2).

For Complex Cystic Lesions ($\geq 10\%$ Solid Component). After confirming benign pathology via FNA (performed twice or combined with core needle biopsy), treatment options include: Thermal ablation techniques (radiofrequency ablation, microwave ablation, laser ablation) for nodules causing compression symptoms, cosmetic concerns, or progressive growth ≥ 2 cm. Ethanol ablation remains effective for complex cysts with $< 20\%$ solid component. Radiofrequency ablation may be superior for complex cysts with $> 20\%$ solid component, though ethanol ablation is still reasonable first-line (1).

Surgical intervention should be considered in selected patients with thyroid nodules under the following circumstances:

Malignant or highly suspicious cytology (Bethesda categories V and VI), where surgery is indicated for definitive oncologic management. Follicular neoplasm or suspicious for follicular neoplasm (Bethesda category IV), which requires histopathological evaluation to distinguish between benign and malignant disease. Contraindications to minimally invasive procedures (e.g., ethanol ablation), including significant bleeding disorders, severe cardiopulmonary comorbidities, or pre-existing contralateral vocal cord paralysis. Persistent or progressive compressive symptoms (e.g., dysphagia, dyspnea) that do not respond to conservative or minimally invasive treatments. Patient preference for definitive surgical treatment after appropriate counseling regarding risks and benefits (3).

The management of thyroid swellings continues to present a clinical challenge, particularly in cases where patients seek alternatives to surgery.

Consequently, there has been growing interest in minimally invasive, nonsurgical treatment approaches aimed at reducing thyroid nodule size. This study was conducted to evaluate a novel therapeutic strategy for benign thyroid swellings involving intralesional administration of triamcinolone.

The procedure was performed with the patient in a supine position under strict aseptic conditions. After appropriate skin preparation and draping of the neck, the thyroid swelling was palpated and stabilized between the index finger and thumb. Triamcinolone was then injected directly into the lesion using an insulin syringe. A dose of 20 mg was administered once weekly for four consecutive weeks. In cases where both thyroid lobes were affected, 20 mg of triamcinolone was injected into each lobe (4).

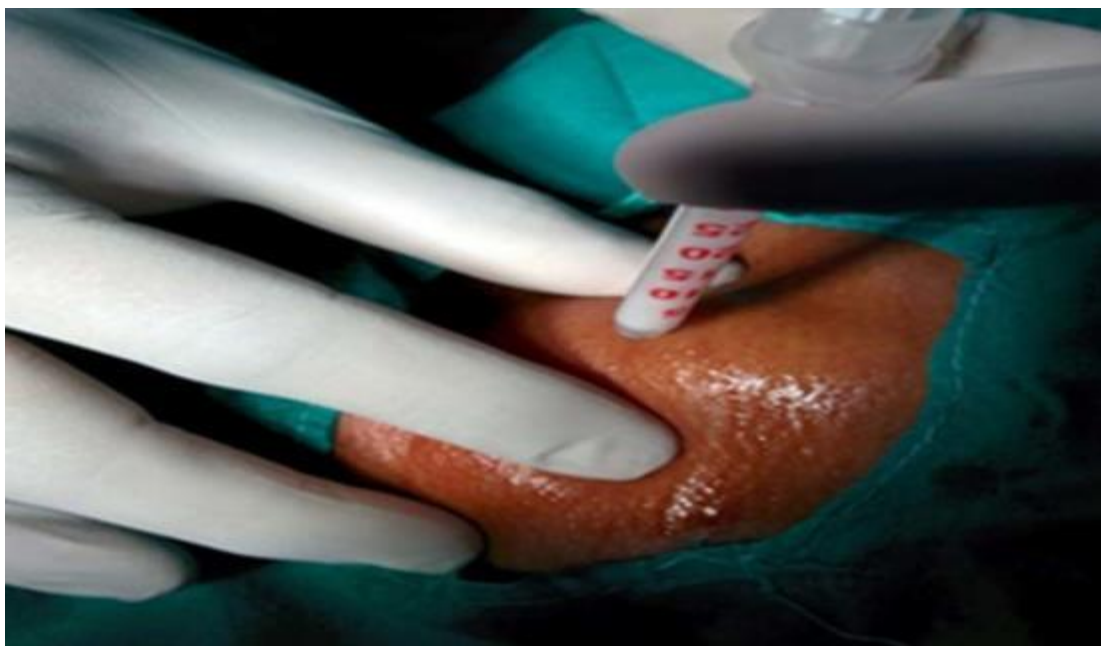


Figure (1): Intrathyroid Triamcinolone injection (5).

Thyroid colloid cysts are among the most frequently encountered benign thyroid lesions and are often identified incidentally during imaging studies. While the majority remain asymptomatic, a subset of patients may

develop cosmetic deformity or compressive symptoms that necessitate therapeutic intervention. Traditional management options include simple aspiration and surgical excision; however, fluid reaccumulation following aspiration is common, resulting in high recurrence rates. In recent years, minimally invasive approaches have gained increasing attention, particularly intralesional corticosteroid therapy using triamcinolone. This technique has been proposed as an effective alternative for reducing cyst volume and preventing recurrence. This review aims to assess the efficacy, underlying mechanisms, clinical outcomes, and safety profile of intralesional triamcinolone injection in the treatment of thyroid colloid cysts (6).



Figure (2): Colloid cyst before & after intralesional injection of Triamcinolone (4)

Triamcinolone is a synthetic glucocorticoid characterized by strong anti-inflammatory and antiproliferative effects, making it a suitable agent for intralesional therapy in cystic thyroid lesions. Triamcinolone exerts its therapeutic effect through multiple pathways, including suppression of the local inflammatory response, reduction of capillary permeability, and inhibition of epithelial cell proliferation. Additionally, it promotes fibrosis within the cyst wall and limits re-accumulation of cystic fluid. Collectively, these mechanisms contribute to a reduction in cyst volume and a lower risk of recurrence (7).

Table (1): Summary Comparison of Treatment Modalities of thyroid colloid cyst (2).

Treatment Method	Success Rate	Recurrence Rate	Complications	Notes
Simple aspiration	Low	High (40–80%)	Minimal	Temporary solution
Ethanol ablation	High (~80–85%)	Low	Low	Most studied method
Triamcinolone injection	~80%	Moderate	Very low	Promising alternative
Surgery	Very high	Very low	Higher	Invasive

Intralesional triamcinolone injection is generally considered a safe therapeutic option, with only minimal adverse effects reported. These may include mild localized pain at the injection site and, rarely, infection. Systemic corticosteroid-related effects are uncommon, and no significant alterations in thyroid function have been consistently observed. Overall, current evidence indicates a favorable safety profile with minimal complications. In conclusion, intralesional triamcinolone injection represents an effective, safe, and minimally invasive treatment modality for thyroid colloid cysts. It contributes to significant cyst size reduction and decreased recurrence rates

while avoiding the risks associated with surgical intervention. Future large-scale, randomized studies are required to establish standardized clinical guidelines and to confirm its long-term efficacy (3).

References:

1. Yang, C. C., Hsu, Y., & Liou, J. Y. (2021). Efficacy of ethanol ablation for benign thyroid cysts and predominantly cystic nodules: a systematic review and meta-analysis. *Endocrinology and Metabolism*, 36(1), 81-95.
2. Kim, J. H., Baek, J. H., Lim, H. K., et al. (2020). 2017 Thyroid Radiofrequency Ablation Guideline: Korean Society of Thyroid Radiology. *Korean J Radiol*, 21(1):1–18
3. Santosh, U. P., Prashanth, K. B., Manjunatha, H. A., Sumanth, K. R., & Triveni, K. M. (2015). Intrathyroid injection of steroid in benign thyroid swellings. *Journal of clinical and diagnostic research: JCDR*, 9(12), MC05.
4. Hu, X., Hao, H., Guo, M., Ma, S. G. (2023). Real-world effect of the treatment for painful subacute thyroiditis: ultrasound-guided intrathyroidal injection of lidocaine and triamcinolone. *Arch Endocrinol Metab.*; 67(3):306–313.
5. Mauri, G., Pacella, C. M., Papini, E., et al. (2021). Image-guided treatments for benign thyroid nodules: state of the art. *Endocrine*, 72(1):15–29.
6. Papini, E., Monpeyssen, H., Frasoldati, A., Hegedüs, L. (2020). 2020 European Thyroid Association Clinical Practice Guideline for Image-Guided Ablation in Benign Thyroid Nodules. *Eur Thyroid J*, 9(4):172–185.