

# Trichilemmal Cysts

Trichilemmal cysts, also known as pilar cysts, are common, benign, and typically slow-growing cystic lesions that arise from hair follicles. These cysts are primarily composed of keratin and are most commonly found on the scalp, though they can occur in other areas of the body where hair follicles are present. Trichilemmal cysts are often asymptomatic but can cause cosmetic concern due to their location or size. Despite their generally benign nature, these cysts can occasionally become inflamed or infected, requiring medical attention.

## Pathogenesis

Trichilemmal cysts originate from the hair follicle, specifically from the outer root sheath, which undergoes keratinization. Unlike epidermoid cysts, which are derived from the epidermis, trichilemmal cysts are characterized by a keratinous lining resembling the outer root sheath of the hair follicle, and they lack a granular cell layer. The cysts are filled with a soft, yellowish keratin material, which is produced by the keratinocytes that line the cyst cavity.

These cysts are often inherited in an autosomal dominant pattern, particularly in cases where multiple cysts are present. The pathogenesis involves an abnormal proliferation of the outer root sheath cells, leading to the formation of a cyst. In some cases, genetic mutations, such as those in the *CTNNB1* gene (encoding for beta-catenin), have been implicated in the development of these cysts.

## Clinical Features and Diagnosis

Trichilemmal cysts are typically asymptomatic, presenting as firm, smooth, non-tender nodules that are often located on the scalp. However, they can occur in other areas such as the face, neck, and torso. The cysts are usually between 1 to 5 cm in diameter, though larger cysts can occasionally form. The overlying skin is typically normal, and pilar cysts do not have a central punctum. When the cyst becomes infected or ruptures, it may cause pain, erythema, or drainage of foul-smelling material.

The diagnosis of a trichilemmal cyst is primarily clinical. The characteristic features, including the location, texture, and appearance of the cyst, are often sufficient for a diagnosis. In uncertain cases, an aspiration or biopsy may be performed to confirm the presence of keratin material within the cyst. Dermoscopy may also aid in diagnosis, revealing the cyst's contents and structure.

## Treatment

While trichilemmal cysts are benign and often asymptomatic, treatment may be necessary for cosmetic reasons, or if the cyst becomes painful, infected, or ruptures. The primary treatment option for trichilemmal cysts is surgical excision, which is typically curative. The goal of surgery is to remove the cyst wall entirely, as incomplete excision can lead to recurrence. In cases where the cyst is inflamed or infected, oral antibiotics may be prescribed to manage the infection before surgery.

In some instances, the cyst may be drained if it is infected or if there is significant discomfort. However, drainage is usually a temporary solution, as it does not address the underlying cyst wall, and recurrence is common if the cyst is not fully excised.

For patients with multiple trichilemmal cysts, a more comprehensive surgical approach may be required, including the removal of all visible cysts to prevent future development. In rare cases, when surgical removal is not feasible, corticosteroid injections may be considered to reduce inflammation and provide symptomatic relief.

### **Recent Advances in Treatment**

Recent advances in minimally invasive procedures for the treatment of trichilemmal cysts include the use of laser therapy and radiofrequency devices. These techniques allow for the removal of the cyst with minimal scarring and quicker recovery times. Studies have suggested that laser excision or ablation can be effective in preventing cyst recurrence, particularly when used in conjunction with traditional surgical techniques.

For patients who are not candidates for surgery, cryotherapy has been proposed as a non-invasive alternative, although its effectiveness remains under investigation.

### **Complications**

While trichilemmal cysts are benign, complications may arise in some cases:

- **Infection:** The cyst can become infected, leading to inflammation, pain, and possible abscess formation. Infected cysts may require incision and drainage in addition to antibiotic therapy.
- **Rupture:** If a cyst ruptures, it can lead to an inflammatory reaction, causing local irritation and swelling.
- **Recurrence:** Incomplete excision or the development of new cysts can lead to recurrence, which may require further surgical intervention.

### **Prevention**

There are no known preventive measures for trichilemmal cysts, particularly for those with a genetic predisposition. However, patients who have had one cyst removed should be advised that

new cysts may develop, particularly in individuals with a family history of multiple cysts. Regular monitoring for new cysts is recommended, especially in individuals with a history of multiple cysts.

## Conclusion

Trichilemmal cysts are common, benign, and typically asymptomatic lesions, most often found on the scalp. While generally not a cause for concern, they may require treatment if they become symptomatic or if there are cosmetic concerns. Surgical excision remains the most effective treatment option, although recent advancements in minimally invasive treatments, including laser therapy and cryotherapy, offer promising alternatives. Recurrence is common, particularly if the cyst wall is not completely excised. Ongoing research into the genetic mechanisms underlying trichilemmal cysts may provide further insight into prevention and treatment strategies in the future.

## References

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