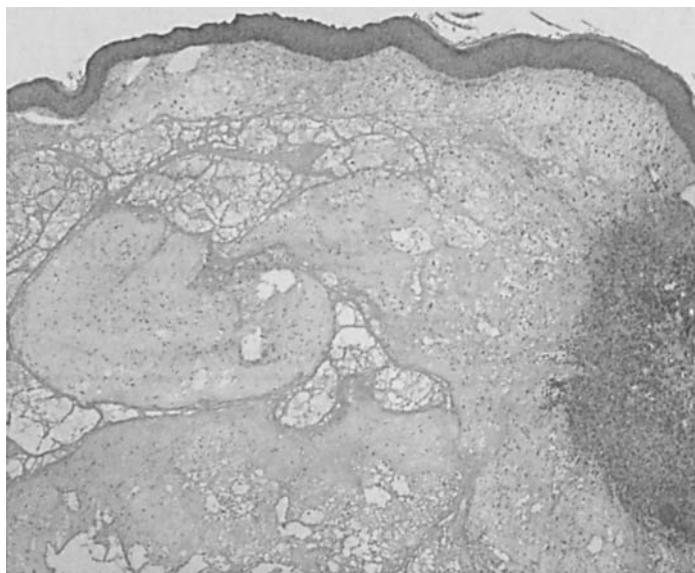


## Larynx: Nodules and polyps

Lester D.R. Thompson, MD



*Figure 1. At low-power magnification, this polyp exhibits an edematous stroma beneath an intact epithelium. Note the area of granulation tissue and surface loss (far right).*

About 1.5% of the overall population suffers from hoarseness; among the most common causes of hoarseness are vocal fold nodules and polyps. Vocal fold nodules and polyps represent reactive changes of the laryngeal mucosa and adjacent stroma that result in benign nodular or polypoid growths. Their etiology is multifactorial, but vocal misuse is one of the most common causes, followed by infection, smoking, and hypothyroidism. Extroverts are more likely to develop nodules and polyps.

The causes of a nodule are slightly different from the causes of a polyp. In children, nodules are slightly more common in boys than in girls; polyps have no predilection for either sex, and they can occur at any age.

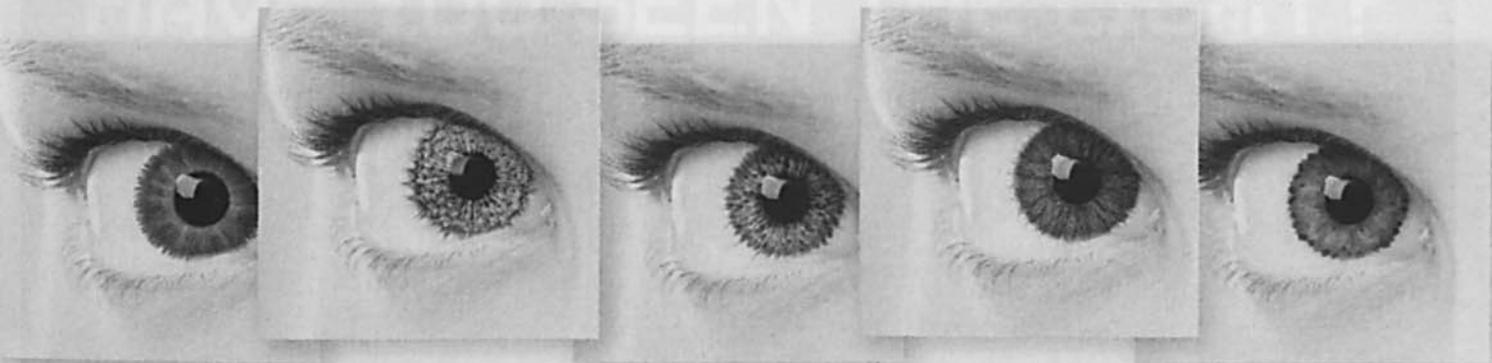
Nodules usually affect the anterior to middle thirds of the true vocal folds, and they are nearly always bilateral. In addition to the vocal folds, polyps can affect the

aryepiglottic fold, ventricular space, and/or the Reinke space, and they are usually unilateral. Voice reeducation, voice therapy, behavior modification, drug therapy, and surgery all play a role in management. Nodules appear as an edematous, gelatinous, hemorrhagic, firm or fixed mass, while polyps manifest as a solitary, soft, rubbery, translucent to red-raspberry-colored mass. Nodules are usually smaller than 0.3 cm, while polyps are usually larger than 0.3 cm.

Histologically, nodules and polyps are indistinguishable. Both exhibit an arc of development. An intact epithelium overlies an edematous stroma, which contains proteinaceous material within the interstitium (figure 1). The vascularized stroma exhibits hemorrhage with a loose myxoid matrix. Inflammation is uncommon, although surface granulation tissue and fibrin may be seen. With time, the myxoid material is replaced by fi-



**PATADAY® Solution: The #1 Prescription Allergy Eye Drop<sup>1</sup>**



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\*This offer is not valid for patients who are enrolled in Medicaid, Medicare, or other federal or state prescription benefit programs including medical assistance programs. Please refer to the terms and conditions on the rebate materials.

## INDICATION AND DOSING

PATADAY® Solution is a mast cell stabilizer indicated for the treatment of ocular itching associated with allergic conjunctivitis. The recommended dose is one drop in each affected eye once a day.

## IMPORTANT SAFETY INFORMATION

PATADAY® Solution is for topical ocular use only. It is not for injection or oral use.

To prevent contaminating the dropper tip and solution, care should be taken not to touch the eyelids or surrounding areas with the dropper tip of the bottle. Keep the bottle tightly closed when not in use.

Patients should be advised not to wear contact lenses if their eyes are red.

PATADAY® Solution should not be used to treat contact lens-related irritation. The preservative in PATADAY® Solution, benzalkonium chloride, may be absorbed by soft contact lenses. Patients who wear soft contact lenses and **whose eyes are not red** should be instructed to wait at least ten minutes after instilling PATADAY® Solution before they insert their contact lenses.

Symptoms similar to cold syndrome and pharyngitis were reported at an incidence of approximately 10%.

For additional information about PATADAY® Solution, please refer to the brief summary of prescribing information on adjacent page.

References: 1. IMS Health, IMS National Prescription Audit™, August 2010 to December 2012, USC 61500 OPTH ANTI-ALLERGY. 2. PATADAY® Solution package insert. 3. Formulary data provided by Pinsonault Associates, LLC, PathfinderRx, April 2013.

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(olopatadine hydrochloride  
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# Pataday®

(olopatadine hydrochloride  
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## INDICATIONS AND USAGE

PATADAY® solution is indicated for the treatment of ocular itching associated with allergic conjunctivitis.

## CONTRAINDICATIONS

None.

## WARNINGS

For topical ocular use only. Not for injection or oral use.

## PRECAUTIONS

### Information for Patients

As with any eye drop, to prevent contaminating the dropper tip and solution, care should be taken not to touch the eyelids or surrounding areas with the dropper tip of the bottle. Keep bottle tightly closed when not in use. Patients should be advised not to wear a contact lens if their eye is red.

PATADAY® (olopatadine hydrochloride ophthalmic solution) 0.2% should not be used to treat contact lens related irritation. The preservative in PATADAY® solution, benzalkonium chloride, may be absorbed by soft contact lenses. Patients who wear soft contact lenses and whose eyes are not red, should be instructed to wait at least ten minutes after instilling PATADAY® (olopatadine hydrochloride ophthalmic solution) 0.2% before they insert their contact lenses.

### Carcinogenesis, Mutagenesis, Impairment of Fertility

Olopatadine administered orally was not carcinogenic in mice and rats in doses up to 500 mg/kg/day and 200 mg/kg/day, respectively. Based on a 40 µL drop size and a 50 kg person, these doses were approximately 150,000 and 50,000 times higher than the maximum recommended ocular human dose (MROHD). No mutagenic potential was observed when olopatadine was tested in an *in vivo* bacterial reverse mutation (Ames) test, an *in vivo* mammalian chromosome aberration assay or an *in vivo* mouse micronucleus test. Olopatadine administered to male and female rats at oral doses of approximately 100,000 times MROHD level resulted in a slight decrease in the fertility index and reduced implantation rate; no effects on reproductive function were observed at doses of approximately 15,000 times the MROHD level.

### Pregnancy

#### Teratogenic effects: Pregnancy Category C

Olopatadine was found not to be teratogenic in rats and rabbits. However, rats treated at 600 mg/kg/day, or 150,000 times the MROHD and rabbits treated at 400 mg/kg/day, or approximately 100,000 times the MROHD, during organogenesis showed a decrease in live fetuses. In addition, rats treated with 600 mg/kg/day of olopatadine during organogenesis showed a decrease in fetal weight. Further, rats treated with 600 mg/kg/day of olopatadine during late gestation through the lactation period showed a decrease in neonatal survival and body weight.

There are, however, no adequate and well-controlled studies in pregnant women. Because animal studies are not always predictive of human responses, this drug should be used in pregnant women only if the potential benefit to the mother justifies the potential risk to the embryo or fetus.

### Nursing Mothers

Olopatadine has been identified in the milk of nursing rats following oral administration. It is not known whether topical ocular administration could result in sufficient systemic absorption to produce detectable quantities in the human breast milk. Nevertheless, caution should be exercised when PATADAY® (olopatadine hydrochloride ophthalmic solution) 0.2% is administered to a nursing mother.

### Pediatric Use

Safety and effectiveness in pediatric patients below the age of 2 years have not been established.

### Geriatric Use

No overall differences in safety and effectiveness have been observed between elderly and younger patients.

## ADVERSE REACTIONS

Symptoms similar to cold syndrome and pharyngitis were reported at an incidence of approximately 10%. The following adverse experiences have been reported in 5% or less of patients:

**Ocular:** blurred vision, burning or stinging, conjunctivitis, dry eye, foreign body sensation, hyperemia, hypersensitivity, keratitis, lid edema, pain and ocular pruritus.

**Non-ocular:** asthenia, back pain, flu syndrome, headache, increased cough, infection, nausea, rhinitis, sinusitis and taste perversion.

Some of these events were similar to the underlying disease being studied.

## DOSAGE AND ADMINISTRATION

The recommended dose is one drop in each affected eye once a day

## HOW SUPPLIED

PATADAY® (olopatadine hydrochloride ophthalmic solution) 0.2% is supplied in a white, oval, low density polyethylene DROP-TAINER® dispenser with a natural low density polyethylene dispensing plug and a white polypropylene cap. Tamper evidence is provided with a shrink band around the closure and neck area of the package.

NDC 0065-0272-25

2.5 mL fill in 4 mL oval bottle

## Storage

Store at 2°C to 25°C (36°F to 77°F)

U.S. Patents Nos. 5,641,805; 6,995,186; 7,402,609

Rx Only

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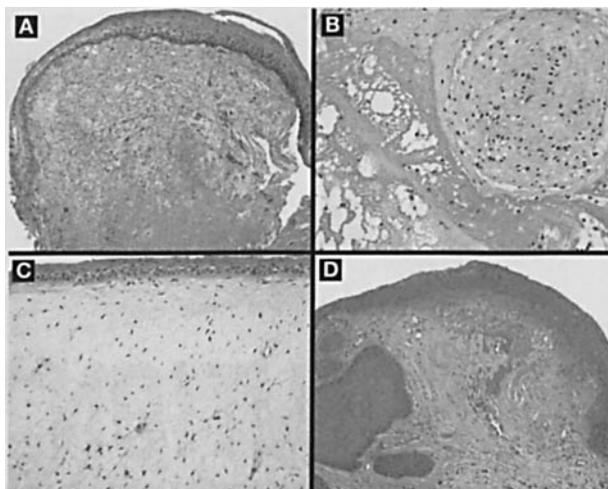


Figure 2. These four images show the stages within the arc of development of a vocal fold polyp: a vascularized stroma with hemorrhage and a loose edematous matrix (A), fibrinous material adjacent to a myxoid stroma (B), a myxoid stroma only beneath an intact epithelium (C), and fibrosis beneath an intact and hyperplastic squamous mucosa (D).

brin-type material, which becomes almost completely collagenized by fibrosis.

Polyps are separated into four types: *edematous*, *vascular*, *myxoid*, and *hyaline*, based on the stage of development at the time the sample was obtained and on the dominant histologic pattern (figure 2). The primary differential diagnoses include amyloid, myxoma, spindle cell (sarcomatoid) squamous cell carcinoma, and contact ulcer.

## Suggested reading

Franco RA, Andrus JG. Common diagnoses and treatments in professional voice users. *Otolaryngol Clin North Am* 2007;40(5):1025-61, vii.

Wallis L, Jackson-Menaldi C, Holland W, Giraldo A. Vocal fold nodule vs. vocal fold polyp: Answer from surgical pathologist and voice pathologist point of view. *J Voice* 2004;18(1):125-9.