Assessing the Prevalence and Implications of Fungal Colonization in Chondroradionecrosis of the Larynx
Craig E. Fichandler, M.D.1,3, Hannan I. Farghaly, M.D.2, Jeffrey M. Bumpous, M.D.1,3
Division of Otolaryngology1, Department of Pathology2, Brown Cancer Center3
University of Louisville School of Medicine

METHODS
A retrospective chart review was conducted by the authors of patients undergoing laryngectomy at a single training program from 1999-2009. Inclusion criteria were total or partial laryngectomy for neoplasm, both primary and residual or recurrent, chondroradionecrosis, or non-functional larynx. Demographic data was collected and pathologic reports were reviewed. Original pathology slides (H&E stained) were examined by one of the authors, and any evidence of fungal invasion was noted. The pathology blocks were then obtained for these specimens and stained with GMS and PAS. Fungal invasion data was recorded for those specially stained slides.

RESULTS
• Five of the 112 (4.5%) patients in the study were given the diagnosis of chondroradionecrosis, of which 2 (40%) showed microscopic evidence of Candidiasis on H&E staining.
• Of note, the two patients who exhibited candidiasis on H&E staining had concomitant Hepatitis C infections.
• Eighteen percent (9/50) of the persistent tumors had a pathologic report that mentioned evidence of chondroradionecrosis (necrosis, ulceration), with an additional 22% (11/50) showing "post radiation changes" (fibrosis, hyalinization).
• None of these pathology reports for persistent tumor mentioned fungal colonization nor invasion on H&E stains.
• Of the thirty one previously irradiated larynges with persistent disease, twenty (64.5%) were positive for fungal invasion seen after special staining.

• In comparison, none of the primary surgical specimens evidenced invasion, and only two showed non-invasive fungal elements.

A two-tailed unpaired t-test showed no statistical difference between the chondroradionecrosis and persistent disease group regarding time until resection after radiation, (t(53) = 0.12, p<0.9).

REFERENCE

DISCUSSION
Chondroradionecrosis of the larynx poses a threat to the patient through a multitude of mechanisms. For one, the compromised function of the larynx may expose the airway to further damage and thwart the organ preservation that was originally intended. Secondly, the necrosis may mimic or even mask underlying neoplasm, delaying further treatment. Thirdly, the exposed tissue presents a means of access for aerodigestive tract microbes to the patient’s systemic organs. Furthermore, repeated biopsies may actually induce chondroradionecrosis, and may eventually create enough tissue damage to make a total laryngectomy inevitable. The importance of clinical, in addition to histological evidence of disease must obviously be weighed in a decision as important as the surgical removal of a larynx.

The overall incidence of chondroradionecrosis (4.5%) and necrosis present in specimens with persistent tumor (18%) mirror those of previously published studies. The significant finding of fungal invasion in the majority of irradiated specimens suggests that prophylaxis for fungi may be helpful for diagnosis and oncologic monitoring, and that special stains may be of value in diagnostic biopsy.