

The Effect of a New Jumbo Biopsy Forceps on Tissue Acquisition in Barrett's Esophagus

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INTRODUCTION

Barrett's Esophagus (BE) is a change in the normal squamous epithelial lining of the distal esophagus to metaplastic columnar epithelium. Patients with BE are at risk for the development of dysplasia and adenocarcinoma. Dysplasia may develop in any area of BE and may endoscopically appear flat and inconspicuous. Endoscopic surveillance with random four quadrant biopsies every 2 centimeters is currently recommended for all patients with BE to limit the miss rate of dysplasia. The goal of the current study was to assess the effect of a new jumbo biopsy forceps in the random sampling of patients with BE.

METHODS

- We recruited 18 patients with a known history of BE proven by previous endoscopy with biopsy. All patients underwent endoscopic surveillance for dysplasia with random four quadrant biopsies taken every 2 centimeters.
- Biopsies were obtained with a standard Radial Jaw® 3 Large Capacity Biopsy Forceps (RJ3) and then alternated with the Radial Jaw 4 Jumbo Biopsy Forceps (RJ4) (Boston Scientific, Natick MA).
- Biopsy specimens were compared by our GI pathologist for depth, width, tissue crush artifact, fixation, and presence of dysplasia. The depth and crush artifact were rated on a graded scale from 1 to 4.
- Mann-Whitney U test was used for comparison between the two groups. Data is presented in median values \pm the standard deviation.

RESULTS

- Of our 18 subjects, the mean age was 69, 13 (72%) were male, 12 (67%) had short segment Barrett's, 16 (89%) were on PPI, and 10 (56%) had a history of tobacco abuse.
- The median width of the biopsy specimens for the RJ3 was $2063 \pm 465 \mu\text{m}$ compared to $2912 \pm 771 \mu\text{m}$ for the RJ4 ($p < .001$)
- The mean depth of the biopsy specimens for the RJ3 was $1138 \pm 381 \mu\text{m}$ compared to $1831 \pm 493 \mu\text{m}$ for the RJ4 ($p < .001$).
- **Dysplasia was seen in 5 of 18 patients with RJ4 biopsies, 3 LGD and 2 HGD, that was missed by RJ3. One patient had HGD by the RJ3 biopsy that was negative in the RJ4. (This was in a <1cm segment).**
- There was no difference in fixation or crush artifact between the two groups, and all samples were adequate for fixation.
- There were no significant complications associated with the use of the jumbo forceps.

Figure 1: Width of Biopsies (μm)

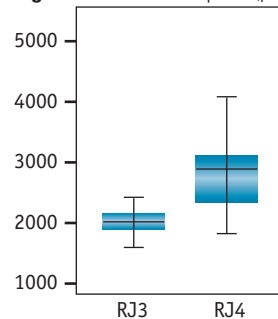
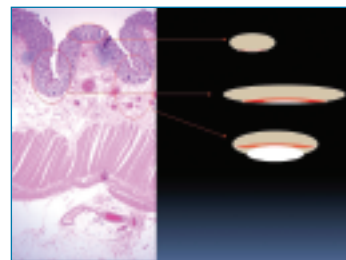
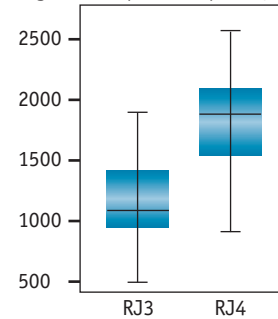


Figure 2: Depth of Biopsies (μm)

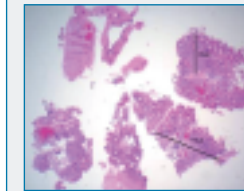


Standard Forceps

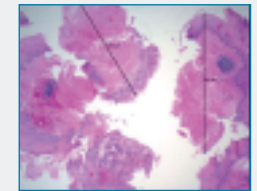
Regular Jumbo

Radial Jaw 4

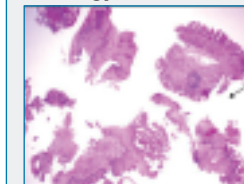
Standard biopsies are on average 1.5 mm wide and 1 mm deep after fixation (image x 20)



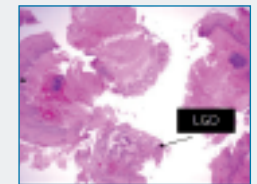
Biopsies from RJ4 (J) are on average 3 mm wide and 2-2.5 mm deep after fixation (image x 20)



Histology RJ3



Histology RJ4 Jumbo



CONCLUSIONS

- 1.) This preliminary investigation of the new jumbo RJ4 biopsy forceps improved tissue sampling in Barrett's Esophagus compared to standard large capacity forceps (width and depth).
- 2.) The use of the RJ4 jumbo forceps significantly improved detection of dysplasia in Barrett's Esophagus.
- 3.) The ability to safely increase the depth and width of sampling in BE may improve our detection of intramucosal carcinoma and buried glands after ablative therapies. Larger prospective studies are warranted to verify these differences.

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