**Study Rationale**
- Barrett’s esophagus confers a significantly elevated risk of developing esophageal adenocarcinoma.
- Dysplasia within the Barrett’s epithelium is the best predictive marker for cancer risk.
- Endoscopic radiofrequency ablation (RFA) with the HALO ablation system (BÂRRX Medical, Sunnyvale, CA) has demonstrated high rates of complete eradication of the Barrett’s epithelium in previously published clinical trials.
- A randomized, sham-controlled trial was conducted to compare RFA to a sham procedure for eradicating Barrett’s with dysplasia and reducing the risk for cancer development.

**Study Design**
- Randomized, sham-controlled trial conducted at 19 U.S. centers.
- 127 patients with Barrett’s with high-grade or low-grade dysplasia (up to 8 cm length).
- Expert pathology lab (Cleveland Clinic) reviewed all biopsies for study endpoints.
- Random assignment to either RFA or a sham intervention (no RFA).
- Frequent biopsies of the esophagus were performed to assess outcomes.
- All patients received high-dose esomeprazole.

**SELECTED STUDY OUTCOMES**

- **Primary analysis was intention-to-treat (ITT)**
  - Complete eradication of dysplasia at 1 year.
  - Complete eradication of intestinal metaplasia at 1 year.
  - Disease progression (progression of dysplasia or development of cancer).
  - Adverse events, including stricture occurrence.
  - Buried gland prevalence at 12 months.

**Endoscopic Ablation Intervention**
- Patients assigned to RFA received ablation at 2-3 month intervals (max 4 sessions).

**Patient Flow**

- **Barrett’s with Dysplasia Confirmed by Central Pathology**
- **Randomization (according to grade and length)**
- **ENTRY**
  - Radiofrequency Ablation
  - Sham Control
- **Serial RFA and Serial Surveillance Biopsies**
- **Serial Surveillance Biopsies**
- **1 YEAR**
  - Endoscopy with Biopsy for Primary Outcomes (Barrett’s with Dysplasia Confirmed by Central Pathology)
  - Endoscopy with Biopsy for Primary Outcomes (Sham Control)

Clinical Trial Summary

Radiofrequency Ablation in Barrett’s Esophagus with Dysplasia

Published in The New England Journal of Medicine – May 2009

Results

Primary Endpoints

<table>
<thead>
<tr>
<th>JTT = intention to treat analysis, PP = per protocol analysis</th>
<th>RFA Group</th>
<th>Control Group</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPLETE ERADICATION of INTESTINAL METAPLASIA (all patients)</td>
<td>77% (83%)</td>
<td>2% (3%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>COMPLETE ERADICATION of DYSPLASIA (LGD patients)</td>
<td>91% (95%)</td>
<td>23% (26%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>COMPLETE ERADICATION of DYSPLASIA (HGD patients)</td>
<td>81% (90%)</td>
<td>19% (20%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Secondary Endpoints
- 87% lower cancer incidence in RFA (1.2%) vs. control (9.3%) (p<0.05)
- 78% lower overall disease progression in RFA (3.6%) vs. control (16.3%) (p<0.05)
- At 1 year, buried glands were present in 5% of RFA vs. 40% of control (p<0.001)
- Adverse events: 2 overnight admissions for chest pain, 1 GI bleed in RFA
- Strictures: 5 patients in RFA (6% of patients, 1.7% of procedures)

Conclusion

A randomized sham-controlled trial of radiofrequency ablation was performed in patients with Barrett’s esophagus with dysplasia. Patients treated with ablation had a very high rate of complete eradication of dysplasia and IM, as well as a decreased rate of disease progression (including cancer development), as compared to controls.