Spectrum of Clinico-pathological Changes in Barrett Oesophagus

RS Punia*, Savita Arya**, H Mohan***, A Duseja***, A Bal+

Abstract

Objectives: Barrett oesophagus is replacement of squamous epithelium to specialised intestinal metaplasia. It is associated with an increased risk for adenocarcinoma which develops through dysplasia. The aim of this retrospective study was to determine the relative age of occurrence and incidence of dysplasia in this part of our country.

Methods: Between January 1999 and June 2002 we diagnosed 13 cases of Barrett oesophagus. Sections were stained with routine H and E and special stain alcian blue (AB) - PAS at pH 2.5.

Results: Out of 55 patients with symptoms of gastro-oesophageal reflux disease, 13 cases were diagnosed as Barrett oesophagus. There were 8 males and 5 females. Majority of the patients (77%) were between 20-40 years of age. At endoscopy, in 84.6% patients, lesions were in the form of islands of red mucosa. On histology examination, in 6 cases, squamous epithelium was replaced by intestinal epithelium containing goblet cells and in 7 cases it was replaced by gastric epithelium. Associated dysplasia was not seen in any of the case, while one case showed associated adenocarcinoma.

Conclusion: Barrett oesophagus is seen in a younger population amongst Indians. A male predominance is noted, but is not as high as reported in Western literature. There is a paucity of patients with pure dysplasia in Barrett metaplasia. Despite the fact that there are a number of patients presenting with Barrett esophagus and carcinoma, very few patients present with dysplasia, indicating that Barrett oesophagus is a silent disease presenting later as a carcinoma. ©

INTRODUCTION

Barrett oesophagus is a complication of gastro-oesophageal reflux disease (GERD). In Barrett oesophagus, the normal squamous epithelium is replaced by metaplastic columnar epithelium. It is important to recognize Barrett oesophagus in oesophageal biopsies because of its premalignant potential. Oesophageal biopsy and staining with Hematoxylin and Eosin (H and E) and alcian-blue periodic acid Schiff (AB-PAS) is the reliable method of diagnosis. The metaplastic epithelium progresses through a multi-step process to low-grade dysplasia, high-grade dysplasia and ultimately to invasive cancer. The combination of oesophageal endoscopy and biopsy is currently the primary modality for routine disease surveillance.

We report histopathological changes in a series of 13 cases of Barrett oesophagus in Northern India.

MATERIAL AND METHODS

This study was conducted on 13 cases of Barrett oesophagus retrieved from the files of department of Pathology at the Government Medical College and Hospital, Chandigarh observed over a period of three and a half years (January 1999 to June 2002).

A detailed history with particular reference to symptoms of gastro-oesophageal reflux, dysphagia and endoscopy findings were noted. Biopsies were fixed in 10% formalin and processed by routine paraffin processing. The slides were stained with routine H and E stain and special stains like Giemsa and AB-PAS at pH 2.5 were also done. The goblet cells, containing acidic mucin (blue colour), become prominent on the biopsies were studied to look for histological changes of esophagitis (basal cell hyperplasia, congestion and intraepithelial polymorphs), metaplastic columnar epithelium (gastric or specialized columnar epithelium), dysplasia, carcinoma and presence of Helicobacter pylori.

RESULTS

Of the 55 patients with symptoms of GERD who underwent oesophageal biopsy with endoscopic
findings suggestive of Barrett oesophagus, 13 cases were diagnosed as Barrett’s oesophagus. Majority (77%) of the patients were between 20-40 years. There were 8 males and 5 females (Table 1).

Table 1: Demographic distribution of patients in Barrett oesophagus

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 years</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>31-40 years</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>41-50 years</td>
<td>—</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>51-60 years</td>
<td>1</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>61-70 years</td>
<td>1</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>5</td>
<td>13</td>
</tr>
</tbody>
</table>

During endoscopy, in majority of the cases (84.6%), lesions were in the form of islands of red mucosa while in one case, it was in the form of a circumferential lesion, and in one case, there was a nodular lesion (Table 2).

Table 2: Endoscopy findings in Barrett oesophagus

<table>
<thead>
<tr>
<th>Endoscopy findings</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islands of red mucosa</td>
<td>11</td>
</tr>
<tr>
<td>Circumferential lesion</td>
<td>1</td>
</tr>
<tr>
<td>Nodular lesion</td>
<td>1</td>
</tr>
<tr>
<td>Coexistent stricture</td>
<td>1</td>
</tr>
<tr>
<td>Coexistent hiatus hernia</td>
<td>2</td>
</tr>
</tbody>
</table>

On histological examination, seven cases showed replacement of squamous epithelium by gastric epithelium while in six cases the squamous epithelium was replaced by intestinal epithelium containing goblet cells, which was confirmed by AB-PAS stain. One case in addition showed development of adenocarcinoma in Barrett oesophagus. Associated oesophagitis and H pylori were present in five and seven cases respectively (Table 3).

Table 3: Histopathological changes in Barrett oesophagus

<table>
<thead>
<tr>
<th>Changes</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastric metaplastic epithelium</td>
<td>7</td>
</tr>
<tr>
<td>Specialized columnar epithelium</td>
<td>6</td>
</tr>
<tr>
<td>Associated dysplasia</td>
<td>—</td>
</tr>
<tr>
<td>Associated adenocarcinoma</td>
<td>1</td>
</tr>
<tr>
<td>Associated oesophagitis</td>
<td>7</td>
</tr>
<tr>
<td>Associated Helicobacter pylori</td>
<td>5</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Barrett oesophagus is the eponymous designation for replacement of the squamous epithelium of the distal oesophagus by glandular epithelium. Norman Barret first described this entity in 1950.1 Traditionally, Barrett oesophagus has been defined by the presence of columnar epithelium lining 3 cm or more of the distal oesophagus. But the definition has changed over the years and there is still no universally accepted definition. As per the ACG (American College of Gastro-enterology) practice guidelines,2 Barrett oesophagus is a change in the oesophageal epithelium of any length that can be recognized at endoscopy and is confirmed to have intestinal metaplasia by biopsy. It is the intestinal metaplasia that is specifically associated with adenocarcinoma. The presence of a long-segment of specialized intestinal metaplasia Barrett oesophagus (LSBE) (3 cm or greater) and short-segment Barrett’s oesophagus (SSBE) (less than 3 cm) have also been recognized.

The incidence of adenocarcinoma of distal oesophagus and oesophago-gastric junction region has been increasing dramatically in the United States and Western European countries.3 The major risk for adenocarcinoma is Barrett oesophagus; the incidence reported is 0.2-2.1% per year.4 Since GERD is common in the West, Barrett oesophagus is not uncommon; with an incidence reported as 6%-15%. In Asia and India, the incidence is lower.5,6 Barrett oesophagus has a bimodal age distribution; first peak at 0-15 years and second at 40-80 years.8 In our study, majority (77%) of our patients were between 20-40 years. Males are predominantly affected with a male to female ratio 1.75:1. Patients usually present with symptoms of GERD or its complications like ulceration or stricture. Endoscopy reveals two distinct patterns- a circumferential type and an island type of Barrett oesophagus. Barrett oesophagus appears beefy and velvety. Majority of our patients (84%) showed islands of Barrett oesophagus, which probably reflected an earlier stage. One case, which showed a circumferential lesion also, showed a stricture. Two cases in addition showed hiatus hernia, which is an occasional concomitant accompaniment of Barrett oesophagus. Dysplastic lesions appear flat and cannot be visualized on endoscopy.5 The endoscopic interpretation may be ambiguous at times, so histological confirmation is necessary. Three histological patterns have been described- cardiac type, fundic type and specialized intestinal metaplasia.9 The cardiac and fundic types resemble gastric mucosa.

The specialized intestinal metaplasia is the most common variety and is characterized by presence of goblet cells. Oesophagitis, which is commonly present, was noted in 7 (63%) cases. H pylori was seen in five cases. In our study, six cases showed specialized columnar epithelium and one case in addition showed development of adenocarcinoma. No case of dysplasia was seen in our study. This observation is similar to that of previous authors who have reported a low incidence of pure dysplasia as compared to dysplasia associated with carcinoma.1,5

**REFERENCES**

3. Nobukawa B, Abraham SG, Gill J, Heitmiller RF.


6. Amarapurkar AD, Vora IM, Dhawan PS. Barrett esophagus.


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**Announcement**

The following Members were awarded the Fellowship of the ICP at Patna APICON 2006

1. Dr. Rakesh Aggarwal, Lucknow
2. Dr. Lt Col RB Deoskar, Pune
3. Dr. Vijay Garg, Ujjain
4. Dr. Ghanshyam B Gupta, Raipur
5. Dr. Sirinder Jit Gupta, New Delhi
6. Dr. Sunil S Gupta, Nagpur
7. Dr. Premashis Kar, New Delhi
8. Dr. Harishanker Nema, Katni
9. Dr. Sunil Prakash, New Delhi
10. Dr. Nawal Kishore Prasad, Ranchi
11. Dr. Jankilal Punglia, Chittorgarh
12. Dr. Girish C Rajadhyaksha, Mumbai
13. Dr. Gandharba Ray, Cuttack
14. Dr. Brinder Mohan Singh, New Delhi
15. Dr. Rakesh Kumar Sahay, Hyderabad
16. Dr. Bhawani Singh, New Delhi
17. Lt Col Govardhan Vyas, Ujjain

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**Announcement**

**Election Results of API/ICP**

The election results of Office Bearers, members of the Governing Body of the Association of Physicians of India and Officer Bearers, Members of the Faculty Council of Indian College of Physicians 2006-2007.

**Results of the API elections**

The following members were declared elected:-

**President Elect** Dr. RK Singal - New Delhi

**Vice President** Dr. BR Bansode - Mumbai (unopposed)

**Hon. Treasurer** Dr. Milind Nadkar - Mumbai (unopposed)

4 Governing Body Members

Dr. Shyam Sunder - Varanasi
Dr. Y Šatyanarayanraju - Hyderabad
Dr. J Mukhopadhyay - Howrah
Dr. NK Singh - Dhanbad

**Results of the ICP elections**

**Dean Elect** Dr. AK Das - Pondicherry

3 **Vice Deans**

Dr. AK Agarwal - New Delhi
Dr. K Tripathy - Varanasi
Dr. KK Dang - Agra

5 Faculty Council Members (all unopposed)

Dr. Nandini Mukherjee - Kolkata
Dr. RK Shrivastava - Bhopal
Dr. OP Kalra - New Delhi
Dr. Anil Chaturvedi - New Delhi
Dr. VN Mishra - Raipur

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