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Research Article

Argon Plasma Coagulation in Barrett's Oesophagus: First Experience from Bangladesh

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Abstract

Background: Barrett's oesophagus is recognized cause of oesophageal carcinoma. Currently different endoscopic treatment modalities are being adopted and evaluated to manage Barrett's mucosa to prevent subsequent malignant transformation.

Methods: We have recently introduced argon plasma coagulation at endoscopy of upper gastrointestinal tract for Barrett's oesophagus management in Bangladesh.

Results: The study included 30 Barrett's oesophagus patients who underwent argon plasma coagulation by a senior Endoscopist. We observed complete eradication of Barrett's oesophagus in 83.3% cases, while reduction of Barrett's mucosal length was seen in 90%.

Conclusion: Argon plasma coagulation appears to be safe and effective for Barrett's oesophagus management. However further work is needed to reach a conclusive statement.

Keywords: Argon Plasma; Coagulation; Barrett's Oesophagus

Introduction

Barrett's oesophagus is a premalignant condition where oesophageal stratified squamous epithelium undergoes columnar metaplastic transformation progressing to low-grade dysplasia, high-grade dysplasia, which eventually may lead to oesophageal adenocarcinoma [1-3]. At the end of 20th century, the incidence of gastroesophageal reflux disease of Barrett's oesophagus was rising alarmingly [4].

With the rise in the incidence of oesophageal cancers [5], the current focus of the management of Barrett's oesophagus has

shifted to endoscopic interventions like argon plasma coagulation (APC), radiofrequency ablation (RFA), photodynamic therapy, electrocoagulation, and cryotherapy to manage dysplasia and metaplasia [6,7]. Patients with history of heartburn are 8.3% more prone to developing Barrett's Oesophagus [8].

The basic principle is to destroy Barrett's mucosa and replace it with nonsquamous epithelium. Such procedures are, however, not free from adverse events, which include stricture and buried gland formation. Not to mention that multiple sessions of interventions are often needed [8-10].

Due to a lack of clinical studies, the prevalence and risk factors of Barrett's oesophagus in Asian countries are not clear. However, studies reveal that, the prevalence rate is between 0.06% to 43.0% in Asia. Since Barrett's oesophagus is a premalignant condition, it's early diagnosis is important to ensure best prognosis [11].

We have recently introduced endoscopic management of Barrett's oesophagus for the first time in Bangladesh with APC.

Materials and Methods

We included the first 30 patients with Barrett's oesophagus in this study, all of were diagnosed of their pathology at upper gastrointestinal tract endoscopy. All endoscopies were performed by a single, senior Endoscopist with over 27 years of experience of performing more than 50,000 diagnostic and therapeutic endoscopies, including performing APC for gastric antral vascular ectasia, gastric angiodysplasia, lower gut vascular malformations and debulking of upper and lower gut malignancies. Diagnosis was made on the basis of visual examination of the lower oesophageal epithelium. Follow up endoscopic examinations were performed at 1 to 3 months intervals by the same Endoscopist. We avoided endoscopic biopsies at baseline and during follow up to reduce cost. The Endoscopist's visual diagnosis of Barrett's oesophagus was sufficient.

APC was performed (Figure 1-3) at a power setting of 55 W, which is 10 W lower than the published literature [10]. Argon gas was supplied at 1.5-1.8 L/min. Each patient underwent single session of APC under total intravascular anesthesia (TIVA) with injection propofol (1 mg/kg body weight) administered intravenously by an Anesthesist. Intravenous tiemonium methylsulfate injection (5 mg) was applied 15 minutes prior to the procedure to reduce oesophageal spasm in order to ensure precision APC and also to avoid any possible complication. Patients were monitored for minimum 1 hour or till complete recovery from TIVA and allowed to go home subsequently. They were advised to take liquid or semi-solid diet for the next 48 hours and were put on proton pump inhibitor for next 2 months.

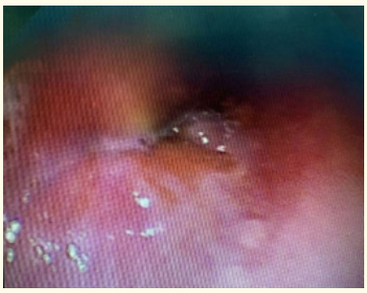

Figure 1: Endoscopic view of Barrett's oesophagus.

Figure 2: Endoscopic view of ablation of Barrett's mucosa by APC.

Figure 3: Endoscopic view of post APC Barrett's oesophagus.

Results

Reduction in the length of Barrett's mucosa was achieved at follow up endoscopy in all 30 patients, with complete eradication in 25 of them. None of the patients developed any serious complication like oesophageal stricture. Out of 30 patients, 12 complained of mild dysphagia and heart burn during the first 1-5 days post-procedure, which resolved with conservative management. However, such complaints did not affect their quality of life and disappeared spontaneously (Table 1).

Discussion

Endoscopic therapies for Barrett's oesophagus are wide ranging and evolving. A recent meta-analysis has evaluated 7 publications

N	30
M:F	21:9
Age	18-65 yrs.
Major complication	none
Heart burn, dysphagia	12
Complete resolution	83.3%
Reduction of Barrett's mucosal length	90%

Table 1: Patients and outcome.

from all over the globe including USA, Russia, Germany, The Netherlands and Australia, but none from our region, as there is paucity of such papers from this part of the world.

In Bangladesh, oesophageal carcinoma is a leading cause of cancer deaths. In 2018, incidence of oesophageal carcinoma was 13.9% and the death rate was 17.9% [13]. Of these, 4.9% were adenocarcinoma [14]. The country lacks facilities and expertise for oesophageal cancer surgeries. There is also a scarcity of Oncologists and advanced radiotherapy centres in the country to treat such a huge burden of oesophageal cancers, like all other cancers. Moreover, most cases present at such a late stage that there is hardly any treatment option that may be offered. Given this harsh reality, our focus has to be on oesophageal cancer prevention in susceptible cases. The campaign against tobacco has gained momentum and laws have also been adapted prohibiting smoking in public places in Bangladesh. Since, Barrett's oesophagus is an established precondition of oesophageal cancer, endoscopic intervention to eliminate the risk of Barrett's mucosa and thus subsequent possible development of oesophageal cancer has to be taken into consideration.

Although, our experience is limited and also, we are the only centre offering endoscopic APC for Barrett's oesophagus management, our data is indeed encouraging. We documented reduction of Barrett's mucosal length in cent percent cases as well as significant eradication (83.3%). This is at par with previous studies from the advanced West, who have reported 86.4% to 90% complete eradication [15-21]. Another notable aspect of our results is that we experienced no major complication.

APC has its limitations. Although we did not experience any major complication in our series, previous studies have reported from 2.2% to 9.1% oesophageal strictures post-APC [17,21]. Besides, there is also risk of oesophageal perforation, the reason why other endoscopic modalities are also being adopted. To reduce the risk of adverse events, APC is also done reducing power settings, however, this is associated with diminished ablation. Another new approach that has been adopted is called 'fluid cushion' where, before APC sub-mucosal fluid injection is given into oesophagus to reduce the risk of stricture formation [22]. Although our experience is limited, we feel that in experienced hands, risks of complications of oesophageal APC is mitigated to great extent.

Our study had its limitations. It is a single centre study, where APC was done by a highly experienced Endoscopist, which may have influenced our excellent results. Also we depended on visual inspection by experienced Endoscopist rather than on endoscopic biopsy for baseline and follow up diagnosis and evaluation of Barrett's oesophagus.

Conclusion

From our initial experience we conclude that APC is a safe and effective endoscopic intervention for management of Barrett's oesophagus. However, the procedure must be performed by an experienced therapeutic Endoscopist. Also prospective, long term clinical trial will be needed to conclude that APC is also effective in eliminating the risk of malignant transformation of Barrett's oesophagus. The durability of non-squamous replacement of Barrett's mucosa is also something that needs to be studied.

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