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The true prevalence of cervical inlet patch in a specific center dealing with esophageal diseases

T. AKAR[1], S. AYDIN[2]

[1]Department of Gastroenterology, Advanced Endoscopic Procedures Unit, Hisar Intercontinental Hospital, Galata University, Galata, Turkey
[2]Department of Internal Medicine, Hisar Intercontinental Hospital, Istanbul, Turkey

Abstract. – OBJECTIVE: Cervical Inlet Patch (CIP) is an interesting entity that is little known and often neglected by endoscopists. It has always been reported as less than expected. In this article, for the first time in the literature, we want to measure the true prevalence of CIP in a center dealing with specific esophageal diseases.

PATIENTS AND METHODS: From October 2020 to October 2021, a total of 283 patients, aged 15-95 years, with mainly dyspeptic and reflux-like complaints were included in this study. All endoscopic procedures were performed carefully by a single endoscopist. Patients were examined for any possible presence of CIP, with adequate sedation and time.

RESULTS: The prevalence of CIP, which was the primary aim of our study, was detected at a rate of 14.8%. Most CIP was observed as a single lesion (73.8%), and many of them (45.2%) were larger than 10 mm. Plenty of patients had upper endoscopy due to dyspeptic complaints, but only 2.5% of them presented with a preliminary diagnosis of laryngeal reflux.

CONCLUSIONS: The true CIP prevalence is higher than reported before. Our result is the highest prevalence rate of CIP was detected in Turkey. In this regard, data coming from centers dealing with specific esophageal diseases may be more reliable and true.

Key Words:
Cervical inlet patch, Dysphagia, Endoscopy, Turkey.

Introduction

Cervical Inlet Patch (CIP) is a special medical term of the heterotopic gastric mucosa (HGM) located in the proximal part of the esophagus[1]. HGM is the presence of some part of gastric mucosal (such as columnar or parietal epithelium) structures in organs other than the stomach (such as the esophagus, duodenum, and biliary tract)[1,2]. HGM is most common in the cervical esophagus[3]. There are lots of speculations and unmet needs about CIP such as its origin, how it occurs and develops, the risk of cancer, whether it is clinically important, and how it should be followed[1,3]. In order to fully understand these situations, first of all, it is very important to determine the true prevalence rate of CIP[2]. Endoscopically, CIP is a salmon-colored, usually islet-shaped structure (diameters ranging from 5 millimeters to 2 centimeters) located in the proximal esophagus[4]. Due to its pinkish color, it can be easily recognized from the pale esophageal mucosa[5]. CIP can be easy-to-detect if the patient is well sedated and the doctor spends much more time with high awareness of CIP[1]. However, since CIP is localized in the upper esophageal sphincter region (just below the pharynx), some difficulties can be expected in recognition, and therefore, speculated that it has been reported at lower-than-expected rates in many studies[1,6,7].

The incidence or prevalence of CIP has been reported on a wide-ranging scale from 0.1% to 13%, depending on factors such as country, device quality, physician awareness, age, gender, and quality of sedation[1,8,9]. Some factors can make its diagnosis easier, but others can make it more difficult. As mentioned above, many factors affecting the prevalence of CIP have been studied before, but no article was published about the experience of a center dealing with specific esophageal diseases. Our unit is a center where specific esophageal diseases are frequently treated endoscopically, such as achalasia, Zenker's diverticulum, jackhammer esophagus, and Barrett's esophagus. For the first time in the literature, as a center dealing with specific esophageal diseases, we wanted to measure the true prevalence of CIP with meticulous work.

Corresponding Author: Tarık Akar, MD; e-mail: drtarikakar@gmail.com

Patients and Methods

Registration data of our endoscopy unit were scanned between October 2020 and October 2021. The files of upper endoscopic procedures performed by a single physician (Dr. T.A) with high awareness of CIP were searched one by one in terms of the suitability of study rules. The inclusion criteria are as follows: patients aged 15-95 who underwent diagnostic endoscopy for reasons such as dyspepsia, dysphagia or reflux-like symptoms were included in the study. Patients who underwent upper endoscopy due to emergency condition (bleeding, perforation, foreign body aspiration), gastroesophageal cancer, liver cirrhosis, coagulopathy, therapeutic procedures (such as polypectomy, endoscopic submucosal dissection, peroral endoscopic myotomy) and for which their procedure could not be completed due to anesthesia, or any complications were excluded. Age, gender, symptoms, endoscopic findings (inlet patch, reflux, Barret esophagus, lower esophageal sphincter status), as well as the presence of *Helicobacter pylori*, were recorded. 302 patients were screened and 19 patients of these were excluded: 6 emergency endoscopies, 5 bleeding, 4 cancer, 2 complications, and 2 cirrhosis. Consequently, a total of 283 patients were included in this study population. Endoscopic procedures were done by a device of Fujifilm BL7000 Eluxeo EG-760 Z (75%) (7-3, Akasaka 9-Chome, Minato-ku, Tokyo, Japan) and Olympus CV-180 EVIS EXERA II (25%) (Shinjuku Monolith, 2-3-1 Nishi-Shinjuku, Shinjuku-ku, Japan). All procedures were performed with a careful endoscopic view for the presence of CIP in a similar time period (minimum 6 minutes). The minimum endoscopy time was 6 minutes, and the maximum time was 14 minutes. Propofol, fentanyl, and midazolam were used for conscious sedation in accordance with the patient's condition. The study was conducted in accordance with the Declaration of Helsinki, with the decision of the local ethics committee.

Statistical analysis was done with SPSS 21 (IBM, Armonk, NY, USA). The normality distribution status in the groups (whether there is a normal distribution) was determined by evaluating with at least two measurements (Kolmogorov Smirnov and Shapiro-Wilk test) and a histogram chart.

Results

A total of 283 patients were enrolled in this study. Basic demographic data of the study were screened in Table I. The prevalence of Cervical Inlet Patch, which is the primary aim of our study, was detected as 14.8%. Most of the CIP lesions were in the form of a single lesion (73.8%). Multiple lesions were observed at a rate of 26.2%. In terms of size, most of them (45.2%) were larger than 10 mm, 35.7% of them were less than 10 mm and only 19% of them were small (<5 mm) and island-shaped. Examples of cervical inlet patches are given in Figure 1. *Helicobacter pylori* positivity was found to be 70.7% in the cases, its intensity was shown in Table I. In 63.3% of the cases, the lower esophageal sphincter function was impaired to various degrees, but endoscopic evidence of esophagitis was detected only in 26.1% of cases. Endoscopy was performed on

Table I. Basic descriptive demographic data of the study.

Variable	n, %
Age (median-min-maximum)	39 (16-92)
Gender	
• Male	163 (57.6%)
• Female	120 (42.4%)
Symtom	
• None	4 (1.4%)
• Reflux	92 (32.5%)
• Dyspepsia	170 (60.1%)
• Dysphagia	10 (3.5%)
• Laryngeal reflux	7 (2.5%)
Inlet Patch	
• Yes	42 (14.8%)
Single	31 (73.8%)
Multiple	11 (26.2%)
• No	241 (85.2%)
Inlet Patch (Size)	
• Island milimetric (< 5 mm)	8 (19%)
• < 10 mm	15 (35.7%)
• > 10 mm	19 (45.2%)
LES (lower esophageal sphincter)	
• Normal	104 (36.7%)
• Dysfunctional	179 (63.3%)
Hill Grade (HG) Status	
• HG 1	53 (18.7%)
• HG 2	85 (30%)
• HG 3	26 (9.2%)
• HG 4	16 (5.7%)
Esophagitis	
• None	209 (73.9%)
• Exist	74 (26.1%)
• LA Grade A	35 (12.4%)
• LA Grade B	36 (12.7%)
• LA Grade C	3 (1.1 %)
• LA Grade D	0 (0%)
Helicobacter Pylori	
• None	83 (29.3%)
• +	156 (55.1%)
• ++	38 (13.4%)
• +++	6 (2.1%)

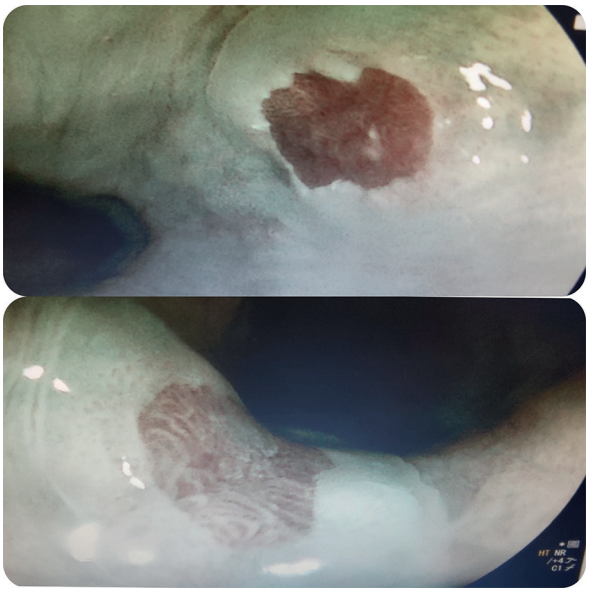

Figure 1. Examples from cervical inlet patch. When the endoscopic procedure is performed with chromoendoscopy, the inlet patch can be seen more clearly and easily.

many patients due to dyspeptic complaints, only 2.5% of them presented with a preliminary diagnosis of laryngeal reflux.

Discussion

CIP is one of the most striking and curious issues in gastroenterology, therefore, many studies[8-11] have been carried out in recent years. These studies[2,8,12] were carried out due to many unmet needs related to this issue. The most important ones are its frequency (incidence and prevalence), origin, clinical importance, whether it causes cancer development risk, and how it will be followed is not known exactly. Perhaps the most important of these is the risk of cancer development and whether it is associated with clinical events such as reflux disease, and Barrett esophagitis[12-15].

CIPs are heterotopic gastric structures located in the proximal part of esophagus, just below the pharynx. Theoretically, heterotopic formation, defined as the presence of any specific structure of an organ to another, is considered an abnormal and pathological finding, except during pregnancy. Examples of these conditions are Barret's Esophagus and intestinal metaplasia[12]. These and similar structures are evaluated for the increased risk of cancer development[16]. Therefore, if detected, it requires endoscopic control at certain time intervals. Of these heterotopic entities, the least known but most speculated is CIP. Its true incidence, prevalence, clinical significance, origin, mechanism of occurrence, complications, co-existing situations, treatment, and follow-up interval are still controversial. Consequently, CIP has been the subject of many studies. Basically, in order to evaluate all these factors well, in the beginning, its true prevalence should be determined very well, according to the gender and racial differences of the countries. CIP's frequency, etiology, associated conditions, cancer risk, and frequency of follow-up are still controversial issues. One of these controversial issues is its prevalence.

In the word, there are many small, medium, and large scales studies in Turkey regarding CIP. The prevalence of CIP has been reported on a very wide scale, from 0.3 to 13%. The main reason for this is the relatively difficult endoscopic examination of the narrow luminous area caused by the upper esophageal sphincter in the proximal esophagus, where potentially CIP lesions can be found. In our study, the prevalence of CIP was found to be 14.8%, which is the highest rate detected in Turkey.

In 2004, Akbayir et al[6] found the prevalence of CIP as 1.67% in a study that included 660 patients. In the same years, the prevalence of CIP was similarly determined by Yüksel[17] 1.8% (9437 patients), Poyrazoğlu et al[3] 3.6% (911 patients), Sahin et al[10] 3.14% (3907 patients), and Alagözlü et al[5] 1% (6760 patients). The main reasons for reporting low CIP prevalence in these studies are insufficient awareness, performing endoscopic procedures without sedation or with insufficient sedation, and not enough time due to a large number of patients. Although the number of patients in our study was quite low compared to these studies, it was sufficient to obtain the true prevalence and all patients were examined endoscopically by only one physician with sufficient sedation and high CIP awareness. On the other hand, the prevalence rates in studies conducted in different countries in the world are much higher in studies conducted in Turkey[4,8,18]. Similar to our study, the CIP prevalence was reported at more than >10% in most of the studies conducted in Europe and Far East Asia, China in centers with less than 500 patients and high CIP awareness[8].

One of the most important reasons why CIP is neglected by endoscopists is their belief that there is no clinical presentation and that it should not be treated. This certainly is a big mistake. CIP is one of the most important causes of laryngospasm, globus sensation, and laryngeal reflux[15]. It can

manifest itself as very important clinical conditions such as cardiac angina[13]. More dangerously, it can cause adenocarcinoma[5,12,16]. However, if a cancer is detected early stage as a result of regular CIP follow-up, it can even be treated with the endoscopic method[14,18,20].

Conclusions

The cervical inlet patch is an interesting entity that is little known and often neglected by endoscopists. The true CIP prevalence is higher than reported before. It can cause different kinds of clinical pictures but is easily treatable endoscopically. Hence, endoscopists should increase their awareness of this issue and spare enough time to detect it.

Conflict of Interest

The Authors declare that they have no conflict of interests.

Ethical Approval

The clinical research application was approved by the Medical Advisory and Ethics Committee of the Hisar Hospital Intercontinental Internal Diseases Department, Gastroenterology Endoscopy Unit.

Authors' Contribution

Working idea and design: T.A., data collecting: S.A. and T.A., Statistical data analysis: T.A., S.A., native English editing and writing: T.A., overview: S.A. and T.A.

Informed Consent

The authors signed an informed consent before the study.

References

1) Ciocalteu A, Popa P, Ionescu M, Gheonea DI. Issues and controversies in esophageal inlet patch. World J Gastroenterol 2019; 25: 4061-4073.
2) Yin Y, Li H, Feng J, Zheng K, Yoshida E, Wang L, Wu Y, Guo X, Shao X, Qi X. Prevalence and Clinical and Endoscopic Characteristics of Cervical Inlet Patch (Heterotopic Gastric Mucosa): A Systematic Review and Meta-Analysis. J Clin Gastroenterol 2022; 56: e250-e262.
3) Poyrazoglu OK, Bahcecioglu IH, Dagli AF, Ataseven H, Celebi S, Yalniz M. Heterotopic gastric mucosa (inlet patch): endoscopic prevalence, histopathological, demographical and clinical characteristics. Int J Clin Pract 2009; 63; 287-291.
4) Weickert U, Wolf A, Schröder C, Autschbach F, Vollmer H. Frequency, histopathological findings, and clinical significance of cervical heterotopic gastric mucosa (gastric inlet patch): a prospective study in 300 patients. Dis Esophagus 2011; 24: 63-68.
5) Alagozlu H, Ergun M, Cindoruk M, Unal S, Dumlu S, Poyraz A, Dursun A. The rare presentations of a large polyp and an esophageal carcinoma in heterotropic gastric mucosa: a case series. J Med Case Rep 2007; 1: 127.
6) Akbayir N, Alkim C, Erdem L, Sökmen HM, Sungun A, Başak T, Turgut S, Mungan Z. Heterotopic gastric mucosa in the cervical esophagus (inlet patch): endoscopic prevalence, histological and clinical characteristics. J Gastroenterol Hepatol 2004; 19: 891-896.
7) Rusu R, Ishaq S, Wong T, Dunn JM. Cervical inlet patch: new insights into diagnosis and endoscopic therapy. Frontline Gastroenterol 2018; 9: 214-220.
8) Fang Y, Chen L, Chen DF, Ren WY, Shen CF, Xu Y, Xia YJ, Li JW, Wang P, Zhang AR, Shao SZ, Yu XN, Peng GY, Fang DC. Prevalence, histologic and clinical characteristics of heterotopic gastric mucosa in Chinese patients. World J Gastroenterol 2014; 20: 17588-17594.
9) Romańczyk M, Romańczyk T, Lesińska M, Romańczyk A, Hartleb M, Waluga M. Influence of narrow-band imaging (NBI) and enhanced operator's attention during esophagus inspection on cervical inlet patches detection. Adv Med Sci 2021; 66: 170-175.
10) Sahin G, Adas G, Koc B, Akcakaya A, Dogan Y, Goksel S, Yalcin O. Is cervical inlet patch important clinical problem? Int J Biomed Sci 2014; 10: 129-135.
11) Agirtan C, Akar T, Akbas S, Akdur R, Aydin C, Aytar G, Ayyildiz S, Baskan S, Belgemen T, Bezirci O, Beyazova U, Beyaztas FY, Buken B, Buken E, Camurdan AD, Can D, Canbaz S, Cantürk G, Ceyhan M, Coskun A, Celik A, Cetin FC, Coskun AG, Dağçinar A, Dallar Y, Demirel B, Demirogullari B, Derman O, Dilli D, Ersahin Y, Eşiyok B, Evinc G, Gencer O, Gökler B, Hanci H, Iseri E, Isir AB, Isiten N, Kale G, Karadag F, Kanbur N, Kiliç B, Kultur E, Kurtay D, Kuruoglu A, Miral S, Odabasi AB, Oral R, Orhon FS, Ozbesler C, Ozdemir DF, Ozkok MS, Ozmert E, Oztop DB, Ozyürek H, Pasli F, Peksen Y, Polat O, Sahin F, Rifat Sahin A, Salacin S, Suskan E, Tander B, Tekin D, Teksam O, Tiras U, Tomak Y, Tumer AR, Turla A, Ulukol B, Uslu R, Tas FV, Vatandas N, Velipasaoglu S, Yagmur F, Yağmurlu A, Yalcin S, Yavuz S, Yurdakok K; Contributing Multidisciplinary Teams (MDT). Establishment of interdisciplinary child protection teams in Turkey 2002-2006: identifying the strongest link can make a difference! Child Abuse Negl 2009; 33: 247-255.
12) Dziadkowiec KN, Sánchez-Luna SA, Stawinski P, Proenza J. Adenocarcinoma Arising From a Cervical Esophageal Inlet Patch: The Malignant Potential of a Small Lesion. Cureus 2020; 12: e9284.

13) Talih T, Arslan E, Talih G, Sipahi M. Inlet patch mimicking unstable angina pectoris. Turk J Surg 2020; 36: 229-232.

14) Orosey M, Amin M, Cappell MS. A 14-Year Study of 398 Esophageal Adenocarcinomas Diagnosed Among 156,256 EGDs Performed at Two Large Hospitals: An Inlet Patch Is Proposed as a Significant Risk Factor for Proximal Esophageal Adenocarcinoma. Dig Dis Sci 2018; 63: 452-465.

15) Mungan Z, Attila T. Dysphagia Caused by. ACG Case Rep J 2020; 7: e00405.

16) Ajmal S, Young JS, Ng T. Adenocarcinoma arising from cervical esophageal gastric inlet patch. J Thorac Cardiovasc Surg 2015; 149: 1664-1665.

17) Yüksel I, Usküdar O, Köklü S, Başar O, Gültuna S, Unverdi S, Oztürk ZA, Sengül D, Arikök AT, Yüksel O, Coban S. Inlet patch: associations with endoscopic findings in the upper gastrointestinal system. Scand J Gastroenterol 2008; 43 :910-914.

18) López-Colombo A, Jiménez-Toxqui M, Gogeascoechea-Guillén PD, Meléndez-Mena D, Morales-Hernández ER, Montiel-Jarquín Á, Amaro-Balderas E. Prevalence of esophageal inlet patch and clinical characteristics of the patients. Rev Gastroenterol Mex (Engl Ed) 2019; 84: 442-448.

19) Kadota T, Fujii S, Oono Y, Imajoh M, Yano T, Kaneko K. Adenocarcinoma arising from heterotopic gastric mucosa in the cervical esophagus and upper thoracic esophagus: two case reports and literature review. Expert Rev Gastroenterol Hepatol 2016; 10: 405-414.

20) Hudspeth VR, Smith DS, Pacicco T, Lewis JJ. Successful endoscopic resection of adenocarcinoma arising in an esophageal inlet patch. Dis Esophagus 2016; 29: 880-882.