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Contribution of Upper Gastrointestinal Endoscopy in the Management of Dysphagia: A Multicenter Study about 324 Cases

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Abstract

Introduction: Esophagogastroduodenoscopy (EGD) is the first-line investigation for patients presenting with dysphagia. It offers both diagnostic and therapeutic benefits. The aim of this study was to assess the role of EGD in the management of dysphagia. **Patients and Methods:** This retrospective, descriptive, multicenter study was conducted from 1st March 2021 to 31 July 2022. All patients with an indication for EOGD due to dysphagia were included. Socio-demographic information, endoscopy indications and findings, lesion anatomopathology, and the endoscopic treatments performed were collected and analyzed using Epi Info version 7.2.6.0 and R 4.4.0. **Results:** The prevalence of dysphagia was 6.8%. The mean age was 46 years (range: 2 - 93 years), with a sex ratio of 0.8 (180 women). Dysphagia was classified as high in 51.8% of cases, was of organic origin in 97.6% of cases, and chronic in 50% of cases. It was primarily associated with epigastric pain (11.4%) and gastroesophageal reflux disease (GERD) (4.9%). Etiologies of dysphagia were identified in 184 patients (56.8%). The principal lesions observed included rings (29.4%), esophageal tumors (25.5%), esophageal candidiasis (15.8%), and peptic lesions (12.5%). Savary-Guilliard bougie dilation was performed in 31.5% of cases. **Conclusion:** EOGD occupies a central role in the management of dysphagia. It has made it possible to identify the etiology in the majority of cases and to treat it in some cases.

Keywords

Dysphagia, Esophagus, Esophagogastroduodenal Endoscopy, Plummer-Vinson Rings, Esophageal Tumors

1. Introduction

Dysphagia is characterized by a sensation of discomfort during swallowing, including the blockage or arrest of the food bolus along the esophagus [1]. Two types are recognized: oropharyngeal dysphagia and esophageal dysphagia, with the latter being the focus of this study. Dysphagia is common, with an estimated prevalence in the general population ranging from 5% to 20% [2] [3]. It is considered an alarming symptom, primarily due to concern for underlying esophageal cancer. The etiologies responsible for dysphagia vary according to age and geographic region and may result in significant morbidity and mortality. It represented the most common presenting symptom (92.1% of cases) in the study by Dia *et al*., which focused on esophageal cancer [4]. Esophagogastroduodenoscopy (EGD) is the cornerstone of the management of esophageal dysphagia, enabling exploration of the upper digestive mucosa and the performance of biopsies. EGD also provides therapeutic options for certain etiologies. In sub-Saharan Africa, studies addressing dysphagia are limited and fragmented. The aim of this study is to assess the role of EGD in the management of dysphagia in Senegal through a multicenter investigation.

2. Patients and Methods

We performed a retrospective, descriptive, multicenter study from 1st March 2021 to 31 July 2022. The study was carried out in the digestive endoscopy units of Aristide Le Dantec Hospital, Principal Hospital of Dakar, and Abass Ndao Hospital Center.

The study population comprised all patients who underwent EOGD during the study period. We included all patients for whom the indication for the examination was dysphagia. Patients with incomplete endoscopic examination results and those in whom an ENT cause was suspected or found on endoscopy were excluded.

From the endoscopy reports, we collected the socio-demographic data, the indications and the results of the endoscopy, the anatomopathology of the lesions as well as the endoscopic treatment performed.

Data entry was performed using Epi Info software (version 7.2.6.0), and analyses were conducted with R software (version 4.4.0). Results are reported as frequencies for qualitative variables, and as means or medians for quantitative variables.

Ethical considerations:

The data were collected and processed in complete confidentiality.

3. Results

A total of 324 patients were included, corresponding to a dysphagia prevalence of 6.8%. The mean patient age was 46 years [range: 2 - 93 years], with a median of 45 years [interquartile range (IQR): 33.0 - 58.0]. Patients aged 30 to 49 years accounted for 45.6% of the sample. There were 180 women (55.6%), resulting in a

sex ratio of 0.8.

The location, nature, and duration of dysphagia were specified for 56 (17.3%), 41 (12.7%), and 28 patients (8.6%), respectively. Dysphagia was high in 51.8% of cases, exhibited an organic appearance in 97.6%, and was longstanding in 50%. The principal associated symptoms included epigastric pain (11.4%), gastroesophageal reflux (4.9%), odynophagia (4.3%), vomiting (3.4%), and deterioration of general condition (3.1%).

The EOGD found causes of dysphagia in 184 patients (56.8%) (Table 1).

Table 1. Distribution of patients according to the causes of dysphagia.

Causes of dysphagia	n/N	Percentage (%)
Rings	54/184	29.4
Esophageal tumor lesions	47/184	25.5
Candidal esophagitis	29/184	15.8
Peptic lesions	23/184	12.5
Radicular lesions	12/184	6.5
Ulcerated oesophagitis	10/184	5.4
Caustic lesions	9/184	4.9
Aspect in favor of achalasia	5/184	2.7
Cardiac tumor	5/184	2.7
Extrinsic compression	4/184	2.2
Post-surgical stenosis	2/184	1.1
Foreign bodies	2/184	1.1
Oesophageal anomalies of indeterminate etiology	18/184	9.8

*Some causes could be associated in the same patient.

There were associated lesions in 89 patients (48.4%). These were mainly gastritis (74.2%), hiatal hernia (20.2%), bulbite (13.5%), bulbar ulcer (4.50%), gastric ulcer (3.40%), and esophageal varices (3.4%).

An esophageal ring was identified in 54 patients (29.4%). It was located at the level of the cervical esophagus and was compatible with a Plummer-Vinson ring in 51 patients (27.7%), with a mean age of 39 years [19 - 93 years] and a sex ratio of 0.28. The ring was impassable in 33 patients (64.7%). Endoscopic dilation using Savary-Gilliard dilators was performed in 32 patients (62.8%), with a favorable outcome marked by the resumption of normal eating after an average of 3 sessions per patient [1 - 8 sessions]. No complications were reported. An association with esophageal tumor was observed in 6 patients. Histopathological examination results were available for 1 patient and indicated squamous cell carcinoma.

A Schatzki ring was observed in 3 patients (1.6%). A session of esophageal dilation with bougies was performed in all patients.

An esophageal tumor was identified in 47 patients (25.5%). The mean age was 47 years [17 - 75 years], with a sex ratio of 1.04. Of the 14 patients for whom anatomopathological data were available, cancer was found in 13 cases (representing 7.1% of dysphagia causes), comprising 12 squamous cell carcinomas and 1 adenocarcinoma. One case of papillary hyperplasia was also reported.

A cardiac tumor was observed in 5 patients (2.7%). According to the Siewert classification, the tumor was type II in 2 cases and type III in 2 cases. No histological examination results were available.

Candidal esophagitis was observed in 29 patients (15.8%). The mean age was 49 years [26 - 76 years], with a sex ratio of 1.23. This condition was associated with a tumor of malignant appearance (6 cases), peptic lesions (2 cases), ulceroesophagitis (2 cases), and esophageal stricture (2 cases).

Peptic lesions were identified in 23 patients (12.5%). Peptic esophagitis was observed in 17 patients, accounting for 9.2% of dysphagia cases, with a mean age of 48 years [8 - 91 years] and a sex ratio of 1.83. The Los Angeles classification was applied to 11 patients, with grade A in 4 cases, grade C in 2 cases, and grade D in 5 cases. The Savary and Miller classification was used for 6 patients, among whom esophagitis was stage I in 3 patients, stage II in 1 patient, and stage III in 2 patients. Two cases of peptic stricture were documented. Barrett's esophagus was identified in 4 patients.

A radiation-induced stenosis was observed in 12 patients (6.5%). The average age was 41 years [30 -54 years] and the sex ratio was 0.71. It was impassable in all patients. An endoscopic dilation with bougies was performed in 7 patients.

Ulcerated esophagitis was identified in 10 patients (5.4%). The mean age was 51 years [19 - 84 years], with a sex ratio of 4. Among the 4 patients for whom histological findings were available, diagnoses included esophageal tuberculosis (1 case), acute ulcerative peptic esophagitis (1 case), subacute erosive esophagitis (1 case), and papillary hyperplasia (1 case).

Caustic lesions were identified in 9 patients (4.9%). Information on the nature of the ingested substance, as well as the date and time of ingestion, was not reported. The mean age was 14 years [2 - 42 years], with a sex ratio of 1.25. One patient (11.1%) presented with grade 1 caustic esophagitis according to the Zargar classification, while 8 patients (88.9%) developed caustic strictures. Endoscopic dilation with bougies was carried out in 7 patients (87.5%). The mean number of sessions was 2 per patient [1 - 8 sessions].

A suspicious presentation of achalasia was observed in 5 patients (2.7%). The mean age was 44 years [32 - 65 years], and 3 of the patients were women. Megaesophagus was identified in 4 patients (80%), esophageal food stasis in 3 patients (60%), and a catch at the cardia in 3 patients (60%). These findings could occur in combination. Pneumatic dilation was performed in one patient.

An aspect of extrinsic compression was present in 4 patients (2.2%). The average age was 45 years [19 - 69 years]. There were 3 women.

Two cases of post-surgical stenosis were reported. One involved a 6-year-old

boy who underwent surgery for an esophageal atresia and received two sessions of endoscopic dilation. The other case concerned an 8-year-old boy operated for caustic stenosis, which did not require dilation as the stenosis was loose and easily traversed.

A food impaction was found in two patients (1.1%). It was associated with a radiation-induced stenosis in one of the patients. The obstruction was removed using biopsy forceps.

A stenosis of unknown etiology was identified in 12 patients (6.5%). The mean age was 53 years [34 - 84 years]. In 9 patients (75%), the stenosis was impassable. Endoscopic dilation with bougies was performed in 6 patients (66.7%), with one patient receiving two sessions of dilation spaced four weeks apart.

A pseudo-tracheal appearance was observed in 6 women (3.3%). The results of the available anatomopathological examination in 1 patient showed papillary hyperplasia.

Endoscopic examination of the esophagus was normal in 136 patients (42%). The mean age was 47 years [6 - 88 years], with a sex ratio of 0.8. Histopathological findings were available for 15 patients (37.5%), revealing normal mucosa in 6 cases, papillary hyperplasia in 8 cases, and viral esophagitis on condyloma in 1 case.

4. Discussion

Dysphagia is prevalent, with estimates in the general population ranging from 5% to 20% [2] [3]. In our study, the prevalence was 6.8%, which is similar to that reported by Fall *et al*. [5]. Higher rates have been observed in Uganda [6]. This disparity may be explained by:

- The difference in study methodology: some, like ours, limited themselves to dysphagia of esophageal origin, while others studied it without presuming its location [6] [7].
- The etiologies differ by geographic region and age. For example, in regions with a high prevalence of esophageal cancer, such as Uganda, dysphagia occurs more frequently [6]. Moreover, it is well established that dysphagia is more common among older individuals, which accounts for its high prevalence in geriatric studies.

The female predominance observed in our study was similarly reported by Rashid *et al*. in Pakistan [8], while Mitra *et al*. identified a male predominance [3]. This gender predominance is variable, reflecting the diverse etiologies that differ by sex and geographic region. The predominance of females in our series may be attributable to the high prevalence of Plummer-Vinson syndrome, which is traditionally more common in women.

The average age of the patients was 46 years. Other authors have reported a higher average age [2] [3]. This may be explained, first, by the fact that most studies focus on adult or geriatric populations, whereas ours included both children and adults, and second, by differences in etiologies according to age and geographic location. Indeed, neoplastic diseases are the most common causes of dys-

phagia in developed countries and occur predominantly in older individuals.

Dysphagia has multiple etiologies. In our study, the primary cause was an esophageal ring (29.4%), consisting mainly of a cervical esophageal ring compatible with a Plummer-Vinson ring (27.7%). While Plummer-Vinson syndrome (PVS) was common in Northern countries during the first half of the twentieth century, its incidence has markedly decreased there due to improvements in nutritional status and prenatal care [9]. However, it remains prevalent in Africa. In Senegal, Dia *et al*. identified 27 cases over 21 months [10], whereas in Morocco, Bakari *et al*. reported 135 cases over 18 years [11]. The ring was impassable in 64.7% of cases, and endoscopic dilation was performed in 62.8% of cases. Treatment involves endoscopic dilation in combination with iron supplementation. A co-occurrence of Plummer-Vinson ring and esophageal tumor was observed in 6 patients. Histological examination revealed squamous cell carcinoma in one patient. This association has also been documented by Basséne *et al*. [12] and Novacek *et al*. [9]. It is well established that PVS increases the risk of digestive cancers, particularly of the hypopharynx and esophagus, thereby justifying regular endoscopic surveillance for the early detection of esophageal cancer [12].

An esophageal tumor was identified in 25.5% of cases. However, histology results were only available for 14 out of 47 patients and found esophageal cancer in 7.1% of cases. This low availability of anatomopathological data constitutes a significant limitation of our study, which may underestimate the prevalence of esophageal cancer and limit the characterization of the histological types encountered in our population. The prevalence of esophageal cancers remains low in West and Central Africa [4] [13], in contrast to East and Southern Africa, where the "African esophageal cancer corridor" is located [14]. Squamous cell carcinoma is the most common histological type (92.3% of cases), consistent with reports from African and Asian countries [4] [13]. In contrast, in America and Europe, adenocarcinoma has become predominant, a trend attributed to the rise in obesity, gastroesophageal reflux disease (GERD), and its complications, particularly Barrett's esophagus, which predisposes to adenocarcinoma of the esophagus [13].

Candidal esophagitis, the most common type of infectious esophagitis, was identified in 29 patients (15.8%). It was found in association with a tumor suspected of malignancy in 6 cases and with esophagitis in 2 cases. This condition typically arises in the context of immunosuppression. However, it may also develop in patients with esophageal motility disorders, pre-existing esophagitis, or those receiving proton pump inhibitor (PPI) therapy.

In our study, peptic esophagitis was identified in 17 patients (9.2%), with a mean age of 48 years. Ouattara *et al*., in Côte d'Ivoire, reported a lower prevalence (3.04%) [15]. In Italy, Areia *et al*. reported a higher prevalence (12.4%) [16]. This variation may be attributable to the older age of Western populations and the higher prevalence of obesity, a known risk factor for GERD. Severe esophagitis was observed in 9 cases. Peptic stricture and Barrett's esophagus were identified in 2 and 4 cases, respectively. Basséne *et al*. [17], Youssouf *et al*. [18], and Ouattara

et al. [15] reported a marked predominance of non-severe forms. The higher frequency observed in our study is probably linked to our inclusion criterion, namely dysphagia, which is commonly seen in complicated cases.

Caustic lesions were identified in 4.9% of cases, with a mean patient age of 14 years. In an endoscopic series, Bassène *et al*. reported a prevalence of 1.7% and a younger mean age of 8.4 years [19]. Gueye *et al*. described, in an adult inpatient setting over an eight-year period, a 0.9% rate of caustic substance ingestion with a mean age of 36.5 years [20]. Ingestion is typically accidental in children within the domestic environment, whereas among adults, it is frequently intentional and associated with suicide attempts [20]. Caustic strictures were present in 88.9% of cases. Treatment is most often endoscopic, relying primarily on pneumatic or bougie dilation. In cases of refractory stenosis, other approaches may be proposed, such as intrastenotic injection of antifibrotic agents or implantation of a prosthesis; surgery is rarely considered. Bougie dilation was performed in 87.5% of cases. Close surveillance of these patients is necessary due to the risk of malignant transformation into squamous cell carcinoma.

Caustic stenosis was found in 88.9% of cases. Treatment is most often endoscopic, relying primarily on pneumatic or bougie dilation. In cases of refractory stenosis, other approaches may be proposed, such as intrastenotic injection of antifibrotic agents or implantation of a prosthesis; surgery is rarely considered. Bougie dilation was performed in 87.5% of cases. These patients require monitoring due to the risk of degeneration into squamous cell carcinoma.

A suspicious feature of achalasia was identified in 5 patients (2.7%). In Senegal, Diop *et al*. reported 13 cases over 7 years in a surgical series focusing on Heller cardiomyotomy [21]. The low prevalence of achalasia observed in African case series may be attributed to the rarity of the disease in Africa, limited awareness of achalasia among non-hepatogastroenterology physicians, and the lack of manometry in most sub-Saharan African countries. Megaesophagus was found in 80% of cases, food stasis in 60%, and resistance at the passage through the cardia in 60% of patients. These results are consistent with those reported by Razafimahefa *et al*. [22]. In our setting, where manometry is unavailable, diagnosis relies on a combination of clinical, endoscopic, and radiological criteria. Pneumatic dilation was performed in one patient. Endoscopic treatment remains the standard of care and includes botulinum toxin injection, pneumatic dilation, and peroral endoscopic myotomy (POEM).

Endoscopic evaluation of the esophagus was normal in 42% of cases. According to the literature, this rate ranges from 32.5% to 42% [2] [8]. Several explanations are possible, including lesions not detected by endoscopy, non-erosive gastroesophageal reflux disease (GERD), or primary or secondary esophageal motility disorders [23]. Systematic, stepwise esophageal biopsies should be performed to avoid missing cases of eosinophilic esophagitis. The incidence of this pathology continues to rise in most Northern countries, possibly due to heightened awareness and the resulting increase in systematic esophageal biopsies. No cases were identified

in our study. When dysphagia is present despite normal endoscopic and histological findings, esophageal manometry is indicated to investigate potential esophageal motility disorders.

5. Conclusion

Upper gastrointestinal endoscopy (EOGD) occupies a central position in the management of dysphagia. It enabled identification of the etiology in more than half of cases—primarily esophageal rings, tumors, and candidal esophagitis—and also facilitated treatment in some instances, particularly through dilatation. Nevertheless, the substantial proportion of normal findings underscores the necessity of developing centers for functional digestive exploration to ensure optimal patient care.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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