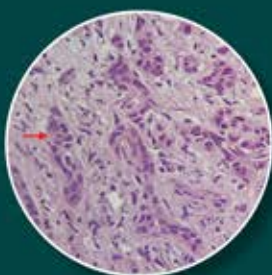
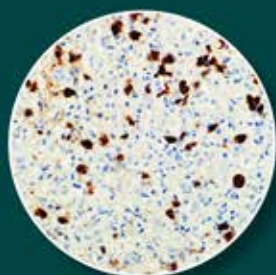




Clinical Cases in Gastroenterology



Editor
Rajesh Upadhyay

Foreword
D Nageshwar Reddy



Contents

Section 1

Approach to Common Gastrointestinal and Liver Symptoms

1. **Returning to Basics Always Helps**..... 3
Vinod Kumar, Shishirendu Parihar, VK Dixit
2. **Fever, Pain Abdomen, and Altered Liver Tests** 6
Sandeep Nijhawan, Anant Gupta
3. **Fever with Jaundice** 13
Vinod Arora, Anupam Prakash
4. **Approach to Dysphagia**..... 18
Pavan Dhoble, Philip Abraham
5. **Approach to Renal Dysfunction in Chronic Liver Disease** 26
Yogesh K Chhabra

Section 2

Diseases of the Esophagus

6. **Perplexing Cases of *Candida* Esophagitis** 33
Sanjay Banerjee
7. **Refractory Gastroesophageal Reflux Disease** 40
VG Mohan Prasad, Vamsi Murthy K, Madhura Prasad, Mithra Prasad
8. **Management of Dysphagia**..... 47
Ashish Chauhan, Soumya Jagannath, Govind Makharia

Section 3

Gastrointestinal Bleed

9. **Nonvariceal Upper Gastrointestinal Bleed** 57
Kunal Das
10. **Obscure Gastrointestinal Bleed**..... 64
Neha Berry, Ajay Kumar
11. **Gastric Variceal Bleed** 72
Rajesh Upadhyay, Sagar Tyagi, VS Gaurav Narayan

Section 4

Diseases of the Liver

- 12. Nonalcoholic Fatty Liver Disease..... 81**
Ashish Kumar
- 13. Alcoholic Hepatitis..... 92**
Rajesh Upadhyay, VS Gaurav Narayan, Priyanka Ojha
- 14. IgM Anti-HEV Positivity in a Patient with Suspected Severe Alcoholic Hepatitis: Cause or a Red Herring? 99**
Harshil Trivedi, Kaushal Madan
- 15. Acute on Chronic Liver Failure 105**
Akash Roy, Mahesh Kumar Goenka
- 16. Intrahepatic Cholestasis..... 112**
Rajesh Upadhyay, VS Gaurav Narayan
- 17. Herb-induced Liver Injury 121**
Bhabadev Goswami, Preeti Sarma
- 18. Autoimmune Hepatitis 125**
Reethesh SR, Manav Wadhawan
- 19. Recompensation and Reversal of Cirrhosis: Myth or Reality?..... 130**
Naveen Bhagat, Arka De, Ajay Duseja
- 20. Sickle Hepatopathy 134**
AC Anand, Shivam Kalia, Dibyalochan Praharaj, Preetam Nath, Sarat Chandra Panigrahi, Bipadabhanjan Mallick, Saroj Kant Sahu

Section 5

Diseases of the Gallbladder and Biliary Tract

- 21. Choledocholithiasis 141**
Nitin Jagtap, D Nageshwar Reddy
- 22. Obstructive Jaundice..... 146**
Deepanshu Khanna, Premashis Kar
- 23. Spontaneous Rupture of Cystic Artery Pseudoaneurysm Presented as Hemobilia..... 150**
VK Dixit, Mayank Bhusan Pateria, Vinod Kumar
- 24. Immunoglobulin G4-related Gastrointestinal Diseases 153**
TS Chandrasekar, BJ Gokul, S Sathiamoorthy, K Raja Yogesh, MS Prasad, TC Viveksandeep

Section 6

Diseases of the Pancreas

25. Management of Acute Pancreatitis	165
<i>Goutham Reddy Katukuri, Rupjyoti Talukdar</i>	
26. Autoimmune Pancreatitis	172
<i>Nitin Gupta</i>	
27. Pancreatic Mass Lesion—A Diagnostic Dilemma	175
<i>VK Gupta</i>	

Section 7

Diseases of the Intestines (Luminal Disorders)

28. Chronic Constipation	181
<i>Omesh Goyal, Prerna Goyal</i>	
29. Chronic Diarrhea	194
<i>Daya Krishna Jha, Vishal Sharma</i>	
30. Chronic Constipation: Frequently Asked Questions	202
<i>Mayank Jain, Jayanthi Venkataraman</i>	
31. Gallstone Ileus Presenting as Subacute Small Bowel Obstruction	209
<i>Sethubabu, Teja J</i>	
32. Small Bowel Neuroendocrine Tumors	213
<i>Mahiboob Sayyed, Manu Tandan</i>	
33. An Interesting Case of SIBO/Dysbiosis	219
<i>Sanjeev Sachdeva, Ujjwal Sonika</i>	
34. Amoeboma Masquerading as Carcinoma Colon	228
<i>Deepak Lahoti, Shami Kumar, Nitin Bhople, Avesh, Meenakshi Jain</i>	
35. Constipation–Functional Dyspepsia Overlap	232
<i>Uday C Ghoshal, Uzma Mustafa</i>	

<i>Index</i>	239
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Approach to Dysphagia

Pavan Dhoble, Philip Abraham

■ CLINICAL CASE

A 43-year-old man came with 5-year history of problems with swallowing. He had a sensation of foods, particularly solids but occasionally also liquids, sticking in the upper sternum level. He succeeded in swallowing by taking sips or drinking water. He occasionally regurgitated frothy fluids and undigested food into his mouth, particularly when bending over or lying on his back after a meal. The patient reported being unable to belch but denied heartburn or odynophagia. There was no decrease in weight.

What should be the next step in management?

- Barium swallow
- High-resolution esophageal manometry
- Endoscopy with esophageal biopsies
- Trial of proton-pump inhibitors.

■ INTRODUCTION

The subjective awareness of difficulty moving food from the mouth to the stomach is known as dysphagia. It may be due to mechanical (anatomic) or functional (motor) disorders. It is clinically classified into two types:

1. Oropharyngeal dysphagia (transfer dysphagia) refers to difficulty in passage of a bolus from the mouth to the esophagus.¹
2. Esophageal dysphagia (transit dysphagia) refers to difficulty in passage of a bolus from the upper esophagus to the stomach.

Odynophagia (painful swallowing) and Globus sensation (constant or sporadic non-painful sensation of a lump, trapped food bolus, or constriction in the throat) may accompany dysphagia.²

■ CLINICAL EVALUATION

History

Clinical history helps to distinguish oropharyngeal from esophageal dysphagia and mechanical from functional disorders.

Oropharyngeal Dysphagia Features

- Inability to propel food into the pharynx
- Difficulty initiating the act of swallowing
- Drooling of saliva or food
- Need to swallow repeatedly to clear food from the oropharynx
- Coughing or choking during a meal
- Nasal regurgitation of food or fluid
- Tracheal aspiration and recurrent aspiration pneumonia
- Accompanying dysarthria and dysphonia
- Swallowing with gurgling noise may indicate presence of Zenker's diverticulum.

Esophageal Dysphagia Features

- Symptoms localized to the sternal or epigastric regions
- Dysphagia to both solids and liquids suggests motor disorder; dysphagia to solids only, or dysphagia to solids that is

gradually worsening, suggests mechanical disorder.

- Patients with motor disorders frequently use techniques such as repetitive swallowing, raising the arms over the head, pushing the shoulders back, or applying the Valsalva maneuver to relieve impaction.
- In patients with mechanical disorder, regurgitation is frequently required to relieve food impaction.
- Patients with esophageal spasms may have chest pain and are sensitive to hot or cold beverages.
- Distal esophageal (Schatzki's) ring or esophageal web may be the cause of intermittent, nonprogressive dysphagia to solids without significant weight loss.
- Worsening dysphagia may signal peptic stricture (particularly when accompanied by heartburn or regurgitation) or esophageal cancer. Anorexia, significant weight loss, or quickly deteriorating dysphagia favors esophageal cancer.
- History of ingestion of pill or caustic substance suggests pill-induced esophagitis and corrosive esophageal injury, respectively.
- Medical history taking must include use of nonsteroidal anti-inflammatory drugs (NSAIDs), antibiotics, anticholinergics, sedatives, opiates, and bisphosphonates, as these could impair esophageal motility or increase the risk of reflux or candidiasis.

■ PHYSICAL EXAMINATION

- Body weight and nutritional status may suggest disease duration and severity.
- Oral cavity inspection for candidiasis, especially in diabetics or those with immune compromise.
- Skin examination for herpetic lesions
- Local examination for neck or supraclavicular lymph nodes, thickening

of soft tissue, thyromegaly, neck or oropharyngeal masses, and evidence of previous head and neck surgery or radiation therapy.

- Muscle fasciculation, weakness, or fatigability may suggest motor neuron disease, myopathy, or myasthenia gravis; focal sensory or motor dysfunction suggests cerebrovascular accident.
- Evidence of scleroderma or CREST (calcinosis, Raynaud phenomenon, esophageal dysmotility, sclerodactyly, and telangiectasia) syndrome suggests motor dysfunction.
- AAA syndrome—achalasia, adrenal insufficiency, and alacrimia.
- Acrokeratosis paraneoplastica (Bazex syndrome) and palmoplantar keratosis in case of squamous esophageal cancer.

■ DIFFERENTIAL DIAGNOSIS

Differential diagnosis of dysphagia is shown in **Table 1**.

■ INVESTIGATIONS

Videofluoroscopy

Videofluoroscopy offers real-time evaluation of oropharyngeal swallowing using barium-mixed boluses of various consistencies. It is helpful for assessing oropharyngeal function and can direct care to improve oropharyngeal coordination, reduce the risk of pulmonary aspiration, and suggest the best feeding consistencies.³

Barium Swallow

In addition to being useful for detecting proximal esophageal lesions including Zenker's diverticulum/pharyngeal pouch, cricopharyngeal bars, and postsurgical and/or radiation-related injuries, it is sensitive for finding esophageal rings and strictures that may be missed on endoscopy.

TABLE 1: Differential diagnosis of dysphagia.

<i>Oropharyngeal</i>	Structural	• Zenker's diverticulum/pharyngeal pouch • Extrinsic compression – Cervical osteophytes – Cricopharyngeal bar – Thyromegaly – Lymphadenopathy – Retropharyngeal abscess • Oropharyngeal tumor • Radiation injury
	Motility	• Central/peripheral nervous system – Cerebrovascular accident – Intracranial mass • Neurodegenerative disease – Multiple sclerosis – Parkinsonism – Alzheimer's dementia – Amyotrophic lateral sclerosis – Postpolio syndrome • Neuromuscular disease – Botulism – Myasthenia gravis – Lambert–Eaton syndrome – Muscular dystrophies – Myopathies (inflammatory and metabolic) • Medications
<i>Esophageal</i>	Structural	• Esophageal webs and rings – Schatzki's ring – Eosinophilic esophagitis • Esophageal strictures – Peptic stricture – Caustic ingestion – Pill induced – Radiation induced – Postsurgical/endoscopic submucosal dissection • Esophagitis – Eosinophilic – Infectious – Pill or caustic – Gastroesophageal reflux disease • Anatomical abnormalities – Hiatus hernia – Esophageal diverticulum • Intramural growths – Leiomyoma – Gastrointestinal stromal tumor • Extrinsic compression – Mediastinal mass – Aberrant right subclavian artery (dysphagia lusoria)

Contd...

Contd...

		• Malignancy – Primary esophageal tumors (squamous and adenocarcinoma) – Metastatic tumors (e.g., melanoma)
	Motility	• Disorders of esophagogastric junction (EGJ) outflow – Achalasia (Types I-III) – EGJ outflow obstruction • Disorders of peristalsis – Absent contractility – Distal esophageal spasm – Hypercontractile esophagus – Ineffective esophageal motility • Secondary motility disorders – Scleroderma – Other collagen vascular diseases – Amyloidosis

Timed barium swallow has been demonstrated to be superior to endoscopy for evaluating suspected distal esophageal motility disorders such as achalasia cardia. To determine how well a treatment technique for achalasia cardia such as balloon dilatation or myotomy works, the height and area of the barium column are assessed at 1, 2, and 5 minutes following a sip.⁴

Esophagogastroduodenoscopy

Endoscopy offers comprehensive knowledge of the esophagus anatomy as well as allows examination and biopsy sampling of the mucosa. It allows evaluation for eosinophilic esophagitis (EoE) and malignancy or premalignant lesions, such as strictures and dysplasia in Barrett's esophagus. Additionally, it can be used for therapeutic procedures. High-definition endoscopy provides better visualization of the mucosa.⁵

Esophageal Manometry

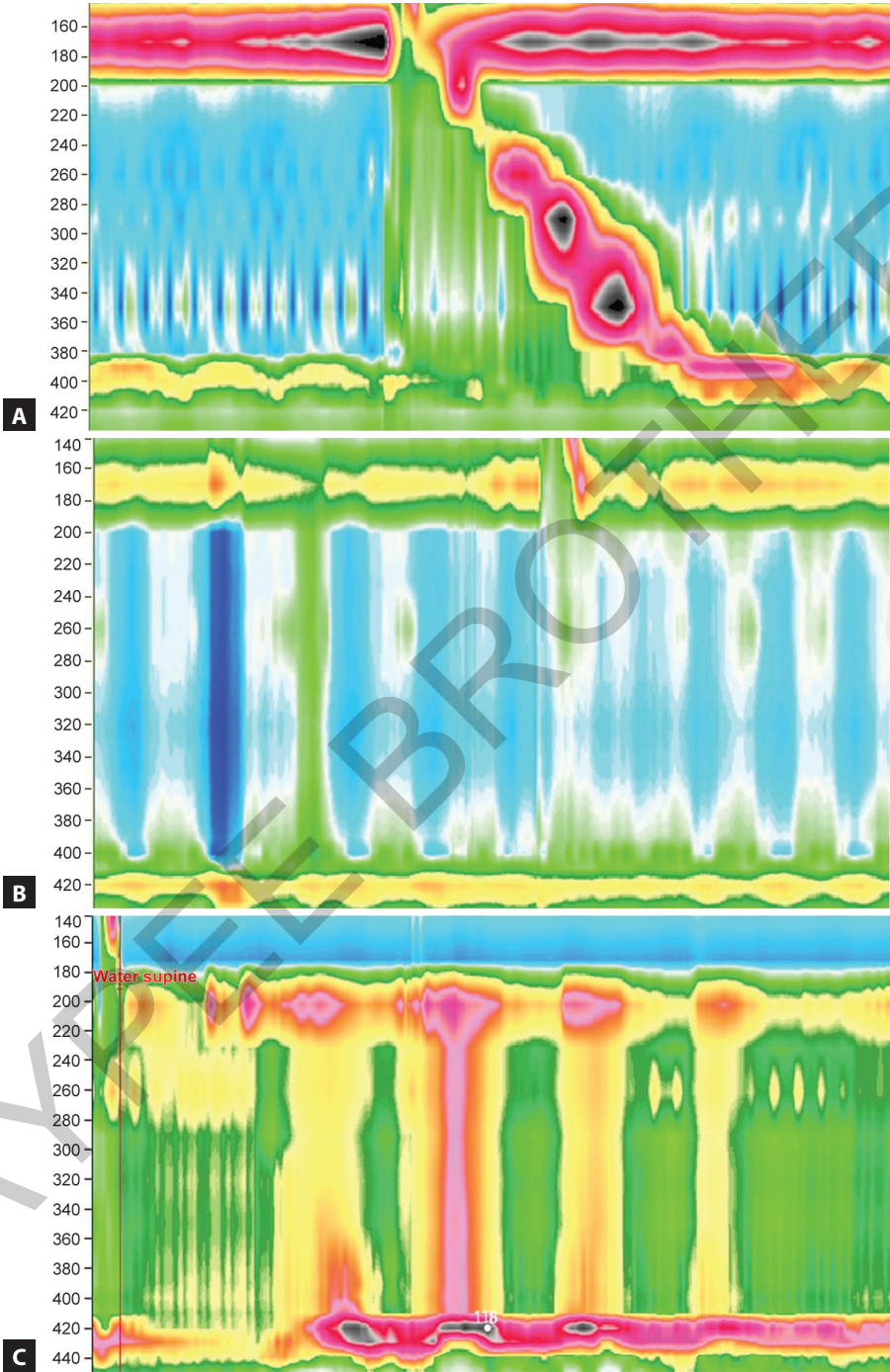
The gold standard test for the identification of esophageal motility abnormalities is high-resolution manometry (HRM). It entails

taking pressure readings of the esophageal musculature and sphincters with solid-state or water-perfused transducers and then utilizing software to create colorimetric pressure graphs⁶ (**Figs. 1A to D**).

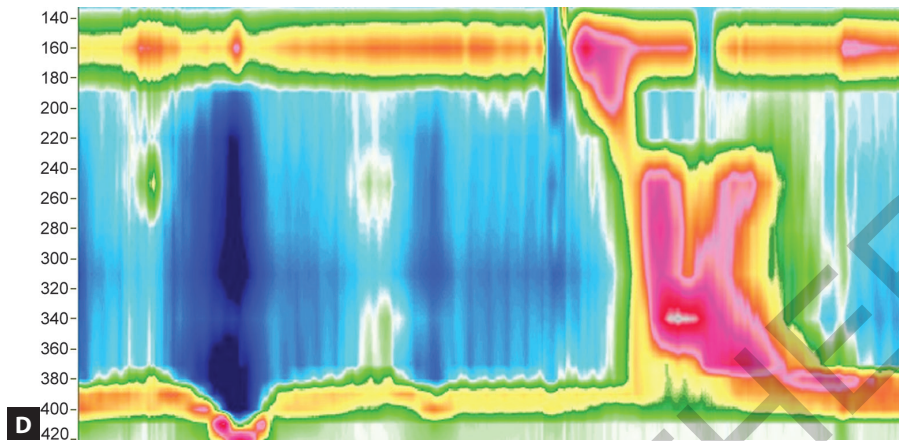
Esophageal motility disorders are categorized by the Chicago classification as (i) disorders of esophagogastric junction (EGJ) outflow (achalasia types I, II, and III, and EGJ outflow obstruction) and (ii) disorders of peristalsis (absent contractility, distal esophageal spasm, hypercontractile esophagus, and ineffective esophageal motility). Lower esophageal sphincter (LES) relaxation in response to swallowing is impaired in achalasia. Based on the pattern of esophageal body motility on HRM, achalasia is subclassified⁷ (**Figs. 1A to D**).

Impedance Manometry

The contents of the esophagus reflect in intraluminal impedance, which increases with intraluminal air and lowers with intraluminal liquid. Bolus transit, bolus clearance, intrabolar pressure, and the connections between esophageal pressure



Figs. 1A to C



Figs. 1A to D: High-resolution esophageal manometry with color-coded pressure heat maps. Blue color represents low-pressure and red represents high-pressure zones. (A) *Normal swallows:* Landmarks of normal pressure topography with propagation of swallow and relaxation of lower esophageal sphincter. (B) *Type 1 achalasia:* Failed esophageal peristalsis with failure of lower esophageal sphincter relaxation. (C) *Type 2 achalasia:* Uniform, nonpropagating increase in esophageal pressure (panesophageal pressurization) with failure of lower esophageal sphincter relaxation. (D) *Type 3 (spastic) achalasia:* Premature, vigorous contractions of distal esophagus with failure of lower esophageal sphincter relaxation.

Source: Reproduced with permission from Dr Shrikant Mukewar, MIDAS Hospitals, Nagpur.

and bolus flow are all objectively evaluated using high-resolution impedance manometry (HRIM).

Recently, pressure-flow analysis has been applied to HRIM interpretation to objectively measure the components of bolus flow timing, retention, pressurization, and luminal distension. This method is useful in differentiating between healthy controls and patients with post-fundoplication dysphagia and nonobstructive dysphagia. The metrics correlate with symptom scores and clinical outcomes in patients with achalasia and major motor disorders as well as with symptom scores in patients without major motor disorders. Additional novel HRIM metrics of the bolus flow time and esophageal impedance integral quantify trans-EGJ bolus flow and esophageal retention, respectively.

The impedance bolus height measures the height of the residual fluid column 5 minutes after a 200-mL quick liquid consumption in an upright position to quantify esophageal retention. Additionally, HRIM can be used to identify behavioral disorders such as supragastric belching and rumination syndrome.⁸

Functional Luminal Imaging Probe

Functional luminal imaging probe (FLIP) measures the esophagus luminal dimensions and esophageal distensibility in response to controlled volumetric distension using impedance planimetry technology. The 16 cm FLIP offers simultaneous evaluation of the distal esophageal body and EGJ, while the 8 cm FLIP assesses EGJ distensibility. Esophageal body distensibility, contractile

response to distension, and EGJ opening mechanics can be evaluated by displaying the changes in esophageal diameter along a space–time continuum with accompanying pressure. Withdrawing the catheter until the balloon is just below the upper esophageal sphincter allows evaluation of the proximal esophageal body's extensibility.

Functional luminal imaging probe panometry is useful to clarify equivocal esophageal motility evaluations on HRM and is useful to confirm a diagnosis of achalasia when achalasia is strongly suspected clinically and on esophagogram but integrated relaxation pressure (IRP) is normal on HRM.⁹

Thoracic Computed Tomography

Computed tomography detects and assesses involvement of adjacent structures or distant spread in esophageal malignancy, esophagus-airway fistula, pseudoachalasia, esophageal injuries, duplication cysts and diverticuli, and esophageal perforation.¹⁰

TREATMENT

Diet

An essential component of treatment, especially for people with oropharyngeal and severe esophageal dysphagia, is swallow rehabilitation with adjustment of food consistency.¹¹ Although oral feeding is preferred, enteral and parenteral nutrition supplementation may be needed in some circumstances. EoE may need trials with elemental and elimination diets.¹²

Pharmacological Interventions

Patients with gastroesophageal reflux disease and EoE are treated with proton-pump inhibitors. Topical corticosteroids may be tried in patients with chronic eosinophilia.¹¹ Clinical trials using biologics for EoE

have shown promising results.¹² Medical treatments for motility issues include calcium-channel blockers and oral nitrates; prokinetics are ineffective.¹¹

Endoscopic Interventions

Esophageal strictures: Push/bougie (longitudinal shear force) and balloon dilators (radial shear force) are two forms of esophageal dilators that give comparable clinical effects.¹³ Refractory stricture is defined as inability to maintain luminal diameter of 14 mm after five consecutive dilatation treatments spaced 1–2 weeks apart;¹⁴ recurrent stricture is defined as failure to maintain luminal diameter of 14 mm for 4 weeks after it has been reached. These can be treated with esophageal stents, endoscopic incisional therapy, and intralesional steroid injections.¹⁵

Palliative care for advanced esophageal malignancies includes the insertion of esophageal stents—covered, partially covered, and uncovered metal, plastic, and biodegradable stents are available.¹⁶

Achalasia cardia: Per-oral endoscopic myotomy (POEM) is now considered first-line treatment for achalasia, particularly in types II and III achalasia. It involves producing a submucosal tunnel for LES myotomy with outcomes similar to laparoscopic Heller's myotomy (LHM).^{17,18} Although it frequently necessitates many sessions and may result in postprocedure reflux, pneumatic (balloon) dilatation (PD) is an acceptable choice for treating achalasia types I and II. However, it carries a risk of up to 8% perforation rate and up to 1% death rate. It is less effective than LHM and POEM.^{15,17,18} Those who are not candidates for definitive surgical or endoscopic procedures may have temporary benefit from botulinum-toxin injection into the LES.¹⁷

In cases where oral feeding is not permitted and the patient needs nutritional support, percutaneous endoscopic gastrostomy is appropriate.

Surgical Interventions

Surgery is recommended for operable malignant esophageal dysphagia. Its function in benign dysphagia is restricted to LHM for achalasia, which has the advantage of being paired with fundoplication to lessen postmyotomy reflux.¹⁸

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Clinical Cases in Gastroenterology

Salient Features

- The book specifically focuses on addressing the need for resources on clinical case presentations for postgraduates. The book aims to provide a comprehensive understanding of gastroenterology and hepatology by incorporating clinical cases encountered in day-to-day practice. The book also focuses on practical knowledge acquisition through case presentations and discussions, providing a method for disease management, exam preparation, and clinical practice.
- The book serves as a valuable educational tool by offering in-depth discussions on clinical cases to enhance thinking abilities and practical knowledge. Recognizing the ever-expanding landscape of knowledge in gastroenterology, the book emphasizes the necessity of adaptability to the evolving field and provides a foundation in fundamental principles.
- Meticulously crafted, the book covers core principles, diagnostic techniques, therapeutic interventions, and recent advancements in gastroenterology and hepatology. The book features a diverse array of clinical cases, ranging from common to rare presentations, chosen to challenge and expand the reader's clinical reasoning.
- Distinguished authors, experts in the field, have contributed to the book, sharing their knowledge and experiences to guide readers through the complexities of clinical decision-making. The book places an emphasis on evidence-based medicine, critical thinking, and a patient-centered approach, encouraging readers to actively engage with the material and develop problem-solving skills.

Rajesh Upadhyay MRCP (UK) FRCP (Glasgow) FICP FIAMS FACP (USA) FISC stands as a distinguished figure in the realm of gastroenterology, currently holding the position of the Senior Director and Head, Department of Gastroenterology and Hepatology, Max Super Specialty Hospital, New Delhi, India. Renowned for his expertise, he holds the unique distinction of establishing state-of-the-art gastroenterology departments in three different hospitals across Delhi NCR.



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In addition to his clinical prowess, he is acclaimed as a Postgraduate Teacher and Examiner for MRCP (UK), underlining his commitment to shaping the future of medical professionals. A dedicated researcher, he has authored more than 100 academic and scientific papers and chapters published in esteemed national and international journals and books.

On a regional, national, and international levels, he has organized, participated in, and delivered more than 400 lectures in numerous conferences including 4 in European countries. He has been the Editor of several books and has served on editorial board of various journals and books. He has been on National Guidelines Committees of the Indian Society of Gastroenterology and API.

His academic excellence and contributions have been recognized by several awards and accolades: Dr BC Roy National Award; IMA National Award—'Distinguished Medical Men for their contribution of highest order in the field of medicine'; Dr V Parmeshwara Life-time Achievement Award, API; Inspiring Gastroenterologist of India Award, Economics Times Doctor's Day Conclave; CME Champion Educator Award, IHW Council; Outstanding Reviewer Award for Journal of Association of Physicians of India (JAPI); IJCP-IMA-NDB Excellence Awards in Gastroenterology; Excellence in Medical Education Award, NBE; Best Paper Awards by the Caledonian Society of Gastroenterology; Best Paper Award, Indian Academy of Medical Specialists; Susruta Award; and Max Healthcare for exemplary performance towards research and publications.

His leadership role in healthcare and medical education has also been well recognized. He was the President, Association of Physicians of India (API) (2015–2016) and the Dean, Indian College of Physicians (2021–2022). He is also a Member Specialist, Advisory Council (Gastroenterology), National Board of Examinations (NBE) and Governing Body Member, AIIMS, Patna.

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