

Improvement of Vocal Pathologies Diagnosis Using High-Speed Videolaryngoscopy

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Abstract

Introduction The study of the dynamic properties of vocal fold vibration is important for understanding the vocal production mechanism and the impact of organic and functional changes. The advent of high-speed videolaryngoscopy (HSV) has provided the possibility of seeing the real cycle of vocal fold vibration in detail through high sampling rate of successive frames and adequate spatial resolution.

Objective To describe the technique, advantages, and limitations of using HSV and digital videokymography in the diagnosis of vocal pathologies.

Methods We used HSV and digital videokymography to evaluate one normophonic individual and four patients with vocal fold pathologies (nodules, unilateral paralysis of the left vocal fold, intracondylar cyst, and adductor spasmodic dysphonia). The vocal fold vibration parameters (glottic closure, vibrational symmetry, periodicity, mucosal wave, amplitude, and glottal cycle phases) were assessed.

Results Differences in the vocal vibration parameters were observed and correlated with the pathophysiology.

Conclusion HSV is the latest diagnostic tool in visual examination of vocal behavior and has considerable potential to refine our knowledge regarding the vocal fold vibration and voice production, as well as regarding the impact of pathologic conditions have on the mechanism of phonation.

Keywords

- stroboscopy
- voice disorders
- vocal cords
- vibration
- dysphonia
- laryngoscopy

Introduction

The various causes of dysphonia cannot be properly differentiated without knowledge of the anatomy and physiology of phonation. Furthermore, visualization of the larynx and vocal folds vibration is essential to the diagnosis. Alterations in vocal fold vibration can contribute to the development of laryngeal pathologies or can be the result of such pathologies, having, in either case, a direct impact on the acoustic quality of the voice.¹

Vocal folds vibrate at a frequency of 80 to 1,000 cycles per second.² As the human eye is capable of perceiving no more

than five images per second,³ it is impossible to evaluate the vibration of the vocal folds during phonation.

According to Talbot's law, an image projected on the retina will persist for ~0.2 seconds. When successive images are presented at intervals of less than 0.2 seconds, they merge and our retina sees the movement as stationary.^{4,5} Based on these principles, videolaryngostroboscopy has been proved to be an essential tool to infer vocal fold vibration. Video-stroboscopy involves pulsing light at a frequency that is of 0.5 Hz or 1.5 Hz lower than the fundamental frequency. As the frequency of the flashes is slightly less than the vibration

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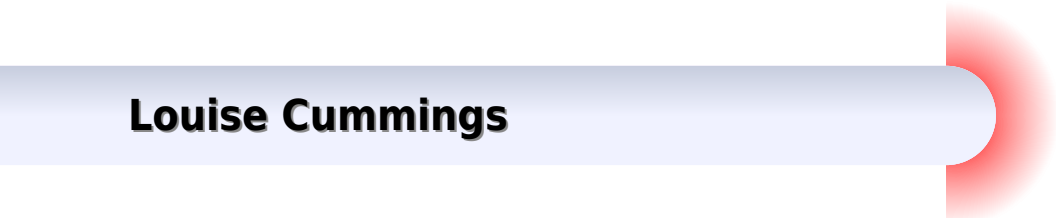
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Vocal Pathologies Diagnosis Treatment Case Studies

Louise Cummings



Vocal Pathologies Diagnosis Treatment Case Studies:

Vocal Pathologies James Paul Dworkin, Robert J. Meleca, 1996-11-01 **Vocal Pathologies** James Paul Dworkin, Robert J. Meleca, 1997 Accompanied by speech samples on two audio compact disks this book is an invaluable resource for professionals and students alike Features two free audio CDs containing speech samples fifty one case studies which examine the history examination findings diagnosis and treatment of each patient explores the applications of acoustic speech aerodynamic and videostroboscopic instrumentation in both the differential diagnoses and treatment of disorders provides detailed updated description of phonosurgical alternatives and presents extensive behavioral voice therapy techniques for benign and malignant disorders incorporating the use of decision tree diagrams and log sheets for recording and teaching patient responses to intervention This new and innovative package is of widespread appeal to academicians clinical supervisors speech language pathologist and otolaryngologists **Communication Sciences and Disorders** Ronald Gillam, Thomas Marquardt, Frederick Martin, 2011 Accompanying computer disk contains videos demonstrating the types of communication disorders and articulations reviewed in the text and photos and animations showing important equipment and anatomical structures **Communication Sciences and Disorders: From Science to Clinical Practice** Ronald B. Gillam, Thomas P. Marquardt, 2019-10-01 Communication Sciences and Disorders From Science to Clinical Practice Fourth Edition is an excellent introductory text for undergraduate students enrolled in their first course in communication sciences and disorders Written by experts in the field this text contains basic information about speech disorders that are related to impairments in articulation voice and fluency language disorders in children and adults and hearing disorders that cause conductive and sensorineural hearing losses It includes basic information on the speech language and hearing sciences and practical information about assessment and intervention practices This new edition provides readers with a wide angle view of communication disorders stressing a sense of the variety of topics that speech language and hearing scientists study and the variety of individuals that Audiologists and Speech Language Pathologists treat **Communication Sciences and Disorders** Ronald Bradley Gillam, Thomas P. Marquardt, 2016 Communication Sciences and Disorders From Science to Clinical Practice Third Edition is an excellent introductory text for undergraduate students enrolled in their first course in communication sciences and disorders Written by experts in the field this text contains basic information about speech disorders that are related to impairments in articulation voice and fluency language disorders in children and adults and hearing disorders that cause conductive and sensorineural hearing losses It includes basic information on the speech language and hearing sciences and practical information about assessment and intervention practices Unlike some other introductory text books this book also includes chapters on multicultural issues deafness dysarthria and dysphagia NEW TO THE THIRD EDITION Updated content with new information on evidence based practice New online video segments that clearly demonstrate a variety of communication disorders at different ages and severities New chapter on cleft lip and palate

New information on cochlear implants and listening New information on spoken language approaches to audiologic habilitation The two chapters on preschool and school age language disorders are now combined into one chapter The two chapters on auditory rehabilitation and deaf education are now combined into one chapter In Text Features Boxes featuring personal stories from the authors and guides to online video segments learning objectives and bolded key terms End of Chapter Features Study Questions Key Terms References and Suggested Readings Instructor Resources Slides in PowerPoint format Test Bank and an Image Bank The Communication Disorders Casebook Shelly S. Chabon, Ellen R. Cohn, Dorian Lee-Wilkerson, 2023-06-06 NOW PUBLISHED BY PLURAL The Communication Disorders Casebook Learning by Example Second Edition focuses on current issues and trends in speech language pathology SLP clinical practice New and advanced students as well as practitioners will benefit from this comprehensive collection of real world examples provided by experienced clinicians and scholars The cases follow an easy to understand structure that allows readers to accompany an SLP through the steps of evaluation diagnosis treatment and follow up of individuals with speech language swallowing and hearing challenges and their families The clinical studies employ a holistic person first approach that considers the beliefs values lived experiences and social contexts of patients throughout the lifespan With a deep commitment to case based learning Shelly S Chabon Ellen R Cohn and Dorian Lee Wilkerson have curated a valuable compendium of thought provoking studies that encourage readers to think like clinicians with empathy understanding and knowledge New to the Second Edition New and updated cases to reflect current research and clinical practice Many new references in both the cases and online Instructor s Manual Key Features A focus on conceptual knowledge areas Comprehensive case histories from leading experts Step by step explanations of diagnoses treatment options and outcomes Basic and advanced learning objectives Comprehension and analysis questions to evaluate understanding of case studies Suggested activities and readings

Occupational Voice Loss Nerys Williams, Paul Carding, 2005-08-09 The first guide to cover aspects of voice loss from an occupational health perspective this reference covers procedures to detect assess and prevent voice loss in schools industrial facilities and other workplace environments as well as covers occupational groups at risk and risk factors for developing voice loss analyzing various chemical e *Current Diagnosis and Treatment in Otolaryngology-head and Neck Surgery* Anil K. Lalwani, 2004 **Case Studies in Communication Disorders** Louise Cummings, 2016-10-06 Designed for students of speech language pathology audiology and clinical linguistics this valuable text introduces students to all aspects of the assessment diagnosis and treatment of clients with developmental and acquired communication disorders through a series of structured case studies Each case study includes questions which direct readers to important features of the case that will facilitate clinical learning A selection of further readings encourages students to extend their knowledge of communication disorders Key features of this book include 48 detailed case studies based on actual clients with communication disorders 25 questions within each case study Fully worked answers to every question 105 suggestions for further reading The text also

develops knowledge of the epidemiology aetiology and linguistic and cognitive features of communication disorders highlights salient aspects of client histories and examines assessments and interventions used in the management of clients

Case Studies of Postoperative Complications after Digestive Surgery Miguel A. Cuesta,H. Jaap Bonjer,2013-11-26 The proposal for this book is to offer a systematic description of the most frequent complications occurring in the three parts of the digestive tract HPB Upper GI and colorectal tracts Every complication from esophageal to the rectum is described systematically through two or three practical cases as has been treated by actual surgical practices of authors serving as surgeon practitioners Description of the case presentation of indication for surgery type of primary surgical intervention and complication is described textually but also and by means of clinical signs laboratory tests radiological studies CT scans and schematic drawings and other methods used for diagnosis and treatment The reader will have access to a practical book in which every current complication can be easily recognized along with relevant information as guide for an adequate treatment

Neurology and Clinical Neuroscience E-Book Anthony H. V. Schapira,2006-12-18 This brand new text provides you with an easy to use comprehensive reference that features a clinical perspective balanced with relevant basic science Inside you ll find discussions of the latest research and how it has led to a greater understanding of the cause of disease as well as burgeoning tests and the latest therapeutic agents available From Alzheimer s disease to vestibular system disorders you ll find the practical guidance you need to diagnose effectively and provide an appropriate therapeutic approach for each individual case Plus a templated four color design offers you easy access to pertinent information Integrates basic science with clinical neurology to help you better understand neurologic diseases and provide the most accurate diagnosis and best treatment plan for each patient Discusses the latest research results and offers new information on treatment options Features the expertise of international authorities providing a worldwide perspective Uses a templated four color format that makes information accessible and easy to understand particularly the basic science concepts **Understanding**

Voice Problems Janina K. Casper,Rebecca Leonard,2006 Now in its 3rd edition this book emphasizes the physiological perspective of voice disorders the behavioral emotional factors that can influence these changes Coverage includes in depth explorations of patient interviewing history taking examination testing *Voice Therapy* Joseph C. Stemple,Edie R. Hapner,Lauren Timmons Sund,2025-08-06 The sixth edition of Voice Therapy Clinical Case Studies continues to offer a comprehensive approach to voice therapy focusing on management strategies derived from real world clinical cases Authored by leading voice clinicians the cases now feature an updated format that integrates comprehensive voice evaluations detailed treatment plans with long and short term goals and new decision making sections to guide therapeutic choices New to this edition videos by master clinicians enhance practical learning through visual demonstrations The new chapters videos and evidence based cases are well suited for classroom instruction Both novice and seasoned clinicians alike will discover invaluable insights for managing even the most challenging voice and upper airway cases Key Updates in the

Sixth Edition Expanded Content Three new chapters addressing The comprehensive voice evaluation Clinical decision making Gender affirming voice care Over 25 new clinical case studies offering in depth exploration of voice and upper airway interventions 37 video demonstrations that provide practical examples of a range of voice therapy techniques Find the full list here Enhanced Structure Chapters reorganized by disorder category to facilitate seamless navigation allowing clinicians to easily locate relevant information Revised chapter introductions clarify key concepts and set the stage for deeper learning Detailed Interventions Each case now offers greater detail on therapeutic interventions helping readers follow treatment progress step by step New Co Editor Lauren Timmons Sund BM MS CCC SLP Additional Features In addition to the clinical cases and videos this text offers The voice evaluation in documentation format Each case includes a dedicated decision making section aiding clinicians in creating personalized treatment plans Cases highlight both in person and telehealth service delivery models reflecting current clinical practices Call Out Boxes spotlight critical topics and provide supplementary information to deepen understanding

Paparella's Otolaryngology: Head & Neck Surgery Michael M Paparella, Sady Saleaiman da Costa, Johan Fagan, *Advancements in Clinical Laryngology, An Issue of Otolaryngologic Clinics of North America* Jonathan M Bock, Chandra Ivey, Karen B Zur, 2019-07-06 This issue of Otolaryngologic Clinics Guest Edited by Drs Jonathan M Bock Chandra Ivey and Karen B Zur is devoted to Advancements in Clinical Laryngology Articles in this important issue include Components of Voice Evaluation Evidence based Evaluation and Management of Hoarseness Summary of AAO HNS Clinical Practice Guideline Identification and Management of Chronic Laryngitis Presbyphonia and Minimal Glottic Insufficiency Renke s Edema Transgender Voice Vocal Fold Paresis Voice Therapy for Primary Treatment of Vocal Fold Pathology Diagnosis and Treatment for Benign Pediatric Lesions Update of Recurrent Respiratory Papillomatosis Unilateral Vocal Fold Immobility in Children Medications and their Effect on Voice Vocal Fold Hyperkeratosis and Dysplasia the white lesion Gastroesophageal Reflux and its Effect on Voice Sulcus Vocalis Updated Medical and Surgical Treatment for Common Benign Laryngeal Lesions Movement Disorders and Voice and Medical Considerations for the Voice Professional

Greene and Mathieson's the Voice and its Disorders Lesley Mathieson, 2013-07-12 This edition has been extensively rewritten in order to reflect the changes in clinical practice and learning methods which have taken place since the 5th edition was published The seventeen chapters are divided into three sections normal voice descriptions of the various types of voice disorders and the methods of treating abnormal voice A profile summary of each voice disorder is provided for easy reference and comparison and tables are used throughout the text New laryngeal images and electroglottographic interpretations have also been included The current emphasis on evidence based practice is addressed in the review and descriptions of intervention strategies used in voice therapy

Learning English Incidentally David Segel, Elise Henrietta Martens, Howard Washington Oxley, James Frederick Rogers, John Hamilton McNeely, Junius Lathrop Meriam, Mary Dabney Davis, Walter Herbert Gaumnitz, Walter James Greenleaf, Willis Branson Coale, Maris Marion Proffitt, 1937 **Statistics of**

Land-grant Colleges and Universities United States. Office of Education,1938 *Textbook of Voice & Laryngology* KK Handa,2017-09-30 This book is a concise guide to laryngology for clinicians Beginning with an overview of clinical anatomy voice assessment and imaging the following sections cover a range of topics from swallowing paediatric laryngology singers and the aging voice to more complex disorders and laryngotracheal reconstruction The text discusses the latest techniques for laryngeal documentation key principles in the management of laryngeal disorders outcome measures quality of life assessment and evolving technologies The book is enhanced by high quality clinical photographs and illustrations Key points Concise guide to laryngology for clinicians Covers range of topics from basic anatomy and physiology to complex disorders and management Includes discussion on techniques for documentation and evolving technologies Highly illustrated with clinical photographs and diagrams A Case-Based Approach to Neck Pain Michael Harbus,Grant Cooper,Joseph E. Herrera,Zinovy Meyler,Marco Funiciello,2022-12-13 Neck pain is one of the most common reasons for patient visits to orthopedic physiatrist primary care and sports medicine offices Most books that cover this topic review it as a chapter within a larger book on orthopedics as a whole or they focus on one specific aspect of spinal pathology This practical text is an evidence based user friendly review of the literature for the breadth of cervical injuries and conditions that present to the busy practitioner Opening with a review of the relevant anatomy subsequent chapters discuss strains and sprains facet joint and discogenic pain radiculopathy and myelopathy Additional chapters cover sports trauma and fractures as well as rheumatologic causes and considerations And while reviewing pathology and its diagnosis and treatment is important proceeding through real case studies is extremely valuable in bringing the diagnosis and treatment of neck pathologies to life hence an engaging section of clinical case material rounds out the presentation Taken together A Case Based Approach to Neck Pain will be an ideal resource for musculoskeletal medicine practitioners of all types

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