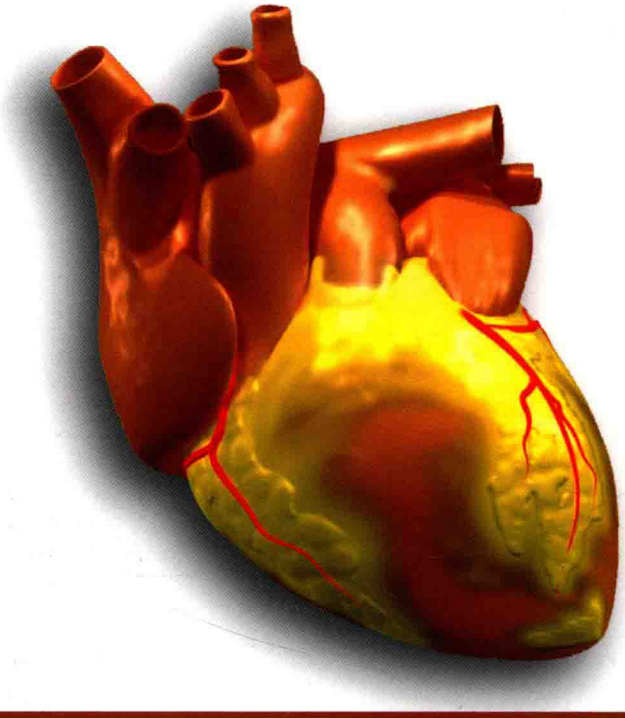
TIPS & TRICKS

SECOND EDITION

TIPS & TRICKS *in* BEDSIDE CARDIOLOGY



ATUL LUTHRA

Foreword
JPS Sawhney

JAYPEE

Includes Photo CD-ROM

Tips and Tricks in Bedside Cardiology

Second Edition

Atul Luthra MBBS MD DNB
Diplomate
National Board of Medicine
Physician and Cardiologist
New Delhi, India
www.atulluthra.in
atulluthra@sify.com

Foreword
JPS Sawhney

JAYPEE BROTHERS MEDICAL PUBLISHERS (P) LTD
New Delhi • London • Philadelphia • Panama

Jaypee Brothers Medical Publishers (P) Ltd.

Headquarters

Jaypee Brothers Medical Publishers (P) Ltd.
4838/24, Ansari Road, Daryaganj
New Delhi 110 002, India
Phone: +91-11-43574357
Fax: +91-11-43574314
Email: jaypee@jaypeebrothers.com

Overseas Offices

J.P. Medical Ltd.
83, Victoria Street, London
SW1H 0HW (UK)
Phone: +44-2031708910
Fax: +02-03-0086180
Email: info@jpmedpub.com

Jaypee-Highlights Medical Publishers Inc.
City of Knowledge, Bld. 237, Clayton
Panama City, Panama
Phone: +507-301-0496
Fax: +507-301-0499
Email: cservice@jphmedical.com

Jaypee Brothers Medical Publishers Ltd.
The Bourse
111, South Independence Mall East
Suite 835, Philadelphia
PA 19106, USA
Phone: + 267-519-9789
Email: joe.rusko@jaypeebrothers.com

Jaypee Brothers Medical Publishers (P) Ltd.
17/1-B, Babar Road, Block-B
Shaymali, Mohammadpur
Dhaka-1207, Bangladesh
Mobile: +08801912003485
Email: jaypeedhaka@gmail.com

Jaypee Brothers Medical Publishers (P) Ltd.
Shorakhute
Kathmandu, Nepal
Phone: +00977-9841528578
Email: jaypee.nepal@gmail.com

Website: www.jaypeebrothers.com
Website: www.jaypeedigital.com

Inquiries for bulk sales may be solicited at: jaypee@jaypeebrothers.com

Tips and Tricks in Bedside Cardiology

First Edition: 2010
Second Edition: **2013**

ISBN 978-93-5090-268-4

Printed at: S. Narayan & Sons

Tips and Tricks in
Bedside Cardiology

System requirement: 

- Operating System—Windows XP or above
- Web Browser—Internet Explorer 8 or above, Google Chrome, Mozilla Firefox and Safari
- Essential plugins—Java and Flash player
  - Facing problems in viewing content—it may be, your system does not have Java enabled.
  - If videos do not show up—it may be, the system requires Flash player or need to manage flash setting.
  - You can test Java and Flash by using the links from the troubleshoot section of the CD/DVD.
  - Learn more about Flash setting from the link in the troubleshoot section.

Accompanying CD/DVD-ROM is playable only in Computer and not in DVD player.

CD/DVD has autorun function—it may take few seconds to load on your computer. If it does not work for you, then follow the steps below to access the contents manually:

- Click on my computer
- Select the CD/DVD drive and click open/explore—this will show the list of files in the CD/DVD
- Find and double click file—"launch.html"

To
My Parents
Ms Prem Luthra
and
Mr Prem Luthra
Who guide and bless me
from heaven

Foreword

With the widespread availability of sophisticated investigative technology, the clinical approach towards the diagnosis of heart disease has undergone a paradigm shift. At present, it has become customary to diagnose a cardiac ailment solely on the basis of an electronic report generated by a CATH-lab., ECHO-room or EPS-facility. Nevertheless, a meticulously taken medical history and a thoroughly performed physical examination have been and will remain indispensable tools to mentally construct a plausible clinical diagnosis of heart disease.

The electrocardiogram (ECG), chest skiagram (X-ray) and echo-cardiogram (ECHO) are simple yet informative diagnostic modalities that have withstood the test of time. They elegantly complement the information gathered from medical history and physical examination and they are cost-effective investigations in resource sensitive settings. Moreover, since the equipment for these tests are portable, the tests can be conveniently performed at the patient's bedside and the results interpreted in the light of clinical data.

I must compliment Dr Luthra for this brilliant and unique title *Tips and Tricks in Bedside Cardiology*. He has elegantly compiled a wide variety of real-world clinical situations encountered during the course of cardiology practice. The discussion and clinical pearls after each case description are really worth appreciating. Cardiology students preparing for their examinations, resident doctors and paramedical staff working in cardiac-care units as well as non-cardiologist physicians dealing with heart patients are definitely going to benefit from this book.

I wish Atul and his excellent book all success.

JPS Sawhney
Chief of Clinical Cardiology
Chairman, Department of Cardiology
Sir Ganga Ram Hospital
New Delhi, India
www.preventivecardiology.in

Preface to the First Edition

There was a time when heart disease was diagnosed at the bedside of the patient. Clinicians were like detectives who would skillfully gather vital diagnostic clues from a thoughtfully taken medical history and a meticulously performed clinical examination. Present-day cardiology is replete with a wide variety of high-tech diagnostic tools that seem to have eclipsed the art of making a clinical diagnosis. In this scenario, it would be worthwhile to amalgamate the conventional with the contemporary as in several other aspects of life in general and the field of clinical medicine in particular.

It gives me immense pleasure to present *Tips and Tricks in Bedside Cardiology,* a harmonious blend of the time-honored clinical approach with the modern technical approach, towards the diagnosis of heart disease. The book is formatted as clinical cases, giving the reader an opportunity to mentally construct a plausible diagnosis from symptoms and signs. Illustrations of electrocardiograms, chest radiographs and echocardiograms that follow, aid in clinching the diagnosis. Each case description is followed by a discussion which incorporates the differential diagnosis in that particular patient. The clinical pearls given at the end provide the key 'take-home' messages.

It has been my endeavor to incorporate most cardiac diseases encountered in heart-clinics and ward-rounds but there may be some omissions. While avoiding case duplication to the extent possible, some clinically important facts may have been emphasized repeatedly. I sincerely hope that the wealth of clinical material presented in a concise, readable and assimilable form will rekindle the romance between the clinician and clinical cardiology. These tips and tricks should benefit students undergoing training in cardiology and preparing for examinations as much as they would interest clinicians involved in the care of heart patients.

Atul Luthra

Preface to the Second Edition

A carefully taken medical history and a meticulous clinical examination are indispensable tools, to arrive at a plausible clinical diagnosis of heart disease. This time-honored approach is suitably complemented by bedside investigations such as the ECG graph, the chest X-ray and an ECHO image. On this premise, I presented to you the First Edition of *Tips and Tricks in Bedside Cardiology*, a compilation of real-world scenarios in clinical cardiology. I must thank my esteemed readers, for their generosity in appreciation and their candid comments on my maiden attempt.

Two years down the line, it is my privilege to place before you the refined version of *Tips and Tricks in Bedside Cardiology*. The most striking feature of the revised edition is vast improvement in the clarity of illustrations. New ECG strips have been taken from the latest (fourth) edition of my book *ECG Made Easy*. Real ECHO images have been incorporated from the latest (third) edition of my book *ECHO Made Easy*. Besides the illustrations, useful clinical details have been added in the section of discussion that follows each case description. Some precious clinical pearls on cardiac auscultation have also been incorporated.

To reiterate what I said in the preface to the first edition, I am confident that this book will rekindle the romance between the clinician and bedside cardiology. The book should serve as an ideal companion for students preparing for their exams, resident doctors undergoing training in cardiology and physicians involved in the care of heart patients.

Atul Luthra

Acknowledgments

I am extremely grateful to:

- My school teachers who helped me to acquire good command over spoken and written English language.
- My professors and lecturers at medical college who taught me the science and art of clinical cardiology.
- My heart patients whose clinical examination and investigation results stimulated my gray matter to make me wiser.
- Authors of textbooks on clinical cardiology to which I referred liberally, while preparing the manuscript.
- M/s Jaypee Brothers Medical Publishers (P) Ltd who repose their faith in me and provide expert editorial assistance with technical excellence.
- My esteemed readers whose generous appreciation, candid comments and constructive criticism keep stimulating me.

Contents

Case 1

Systemic Hypertension, Headache & Dizziness

Patient Profile

Age: 56 Sex: Male Built: Obese

Chief Complaints

- Frequent headaches and dizzy spells with blurring of vision.
- Easy fatiguability and breathlessness on mild physical exertion.

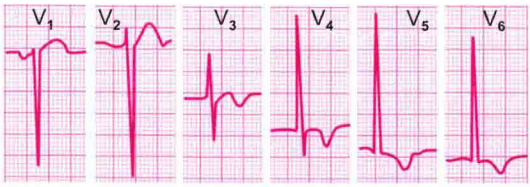
Relevant History

- The patient was diagnosed to have hypertension at the age of 28 years. At that time, he was investigated for secondary causes but no abnormality was detected on renal and endocrine investigations.
- He was prescribed some antihypertensive medicines, but did not take them regularly and was not on periodic medical follow-up.
- Patient had always been overweight and detected to be a diabetic about 10 years back. He had not got his lipid profile checked recently.
- He smoked 8 to 10 cigarettes per day and consumed 2 to 3 pegs of whiskey, on most days of the week.

Physical Examination

- Pulse: 84, BP: 160/100, Temp.: 98.2, Resp.: 22.
- Pulse: regular, good volume, bounding in character.
- JVP: normal, Thyroid: not palpable, Edema: nil.
- CVS: apex beat sustained & heaving in nature;
  systolic pulsations seen in the aortic area;
  S_1 normal, S_2 normally split, A_2 loud, S_4 heard;
  Gr. II/VI soft systolic murmur in the aortic area.
- Chest: normal breath sounds; no rhonchi or crepts.

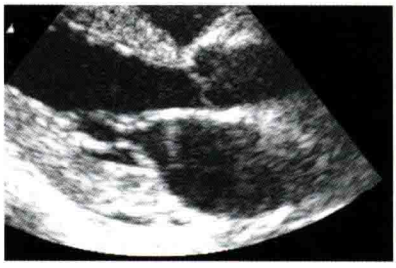
An ECG was obtained.



ECG Findings

- Tall R waves in leads V_5, V_6
- Deep S waves in leads V_1, V_2.

An ECHO was also performed.



ECHO Findings

- Thickening of septum and LV posterior wall
- Obliteration of the left ventricular cavity.

DIAGNOSIS

- Hypertensive heart disease.

Discussion

- ECG criteria of LV hypertrophy are:
  - LVH is indicated on the ECG by presence of tall QRS complexes. The voltage criteria of S in V_1/V_2 plus R in V_5 / V_6 greater than 35 mm (Sokolow criteria) is often used. The R wave is taller than 11 mm in lead aVL (Framingham criteria).
  - There may be associated LV 'strain pattern' with S-T segment depression and T wave inversion in the lateral precordial leads. Left axis deviation of the QRS complex is observed.
  - In left ventricular diastolic overload, the tall R wave in lead V_5/V_6 is preceded by a deep, narrow Q wave and followed by a tall, upright T wave. Causes of LV diastolic overload are valvular regurgitation (MR, AR) and left to right shunt (VSD, PDA).

- Indications for echo in systemic hypertension are:
  - Detection of left ventricular hypertrophy (LVH)
  - Assessment of LV systolic & diastolic dysfunction
  - Detection of coexisting coronary artery disease
  - Detection of mitral and aortic valve degeneration
  - Detection of aortic dilatation or coarctation of aorta

- Echo features of LV hypertrophy are:
  - Thickening of the interventricular septum (IVS) and left ventricular posterior wall (LVPW). The thickness of septum and free wall exceeds 12 mm (normal 6 to 11 mm).
  - Small left ventricular cavity size. Thickening of the IVS and LVPW leads to obliteration of the LV cavity in systole. Thick papillary muscles with prominent trabeculae carneae are seen parallel to the posterior wall.
  - The echo picture of LVH due to hypertension is simulated by LVH due to other conditions causing LV pressure overload such as aortic valve stenosis, coarctation of aorta and hypertrophic cardiomyopathy.

Clinical Pearls

- Presence of LVH is the most common abnormality on echo in a hypertensive patient. Systemic hypertension is also the most important cause of LVH. Echo cardiography is 5 to 10 times more sensitive than ECG in detecting LVH.
- LVH is an independent predictor of cardiovascular morbidity and mortality as a risk factor for myocardial infarction, heart failure and sudden cardiac death.
- The apex beat is displaced downwards and outwards, is sustained in entire diastole and heaving in nature. It indicates the presence of LVH and is also observed in aortic valve stenosis and coarctation of aorta.
- A loud aortic component (A_2) of the second heard sound (S_2) is a reliable indicator of systemic hypertension. In aortic stenosis, the A_2 is muffled. An audible S_4 in presystole indicates atrial contraction against a non-compliant and hypertrophied left ventricle.
- Prominent systolic pulsations felt along with a soft systolic murmur, in the second right intercostal space adjacent to the sternum (aortic area), indicate dilatation of the proximal aortic root.

Case
2

Exertional Angina, Fainting Episodes

Patient Profile

Age: 72 Sex: Male Built: Average

Chief Complaints

- Retrosternal discomfort on climbing stairs, since 2 months.
- Orthostatic dizziness on standing up from sitting position.
- Episodes of lightheadedness and fainting after exertion.

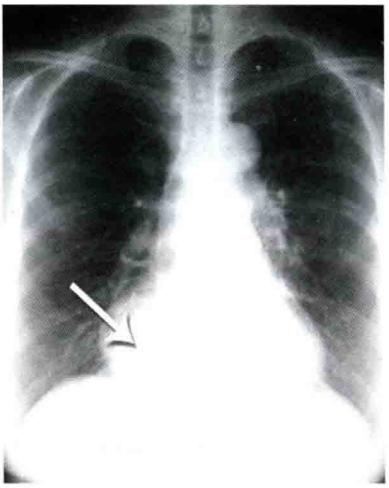
Relevant History

- Patient had been a hypertensive and diabetic for several years, fairly well controlled on regular medication.
- His present symptoms had appeared about 2 months back and hindered his daily activities even within the house.
- Although he felt tired and fatigued easily, there was no history of orthopnea or paroxysmal nocturnal dyspnea.
- There was no history of palpitations or skipped beats that preceded the episodes of fainting.
- His daily cardiac medication included isosorbide mononitrate 40 mg. metoprolol 50 mg, aspirin 75 mg, ramipril 5 mg and atorvastatin 10 mg.

Physical Examination

- Pulse: 68, BP: 140/76, Temp.: 98.2, Resp.: 20.
- Pulse: regular, fair volume, normal in character.
- JVP: normal, Thyroid: not palpable, Edema: nil.
- CVS: normal precordium and apex beat location; systolic pulsations seen in the aortic area; S_1 normal, A_2 loud, S_4 audible in presystole; Gr. II/VI soft systolic murmur in aortic area.
- Chest: no rhonchi or crepts audible.

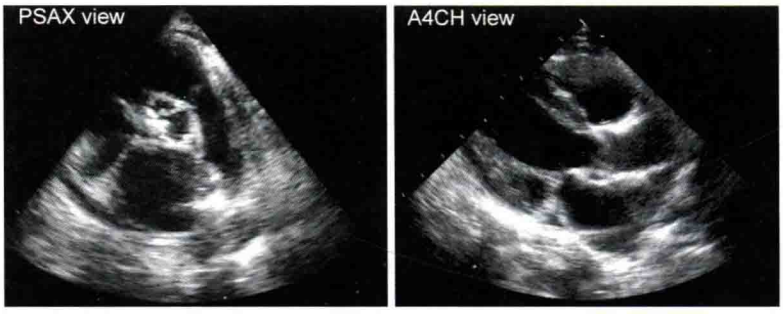
An X-RAY was ordered.



X-RAY Findings

- Enlargement of the heart
- Prominent aortic knuckle.

An ECHO was also performed.



ECHO Findings

- PSAX view: Calcified aortic annulus
- A4CH view: Calcified mitral annulus.