

Small Group Session I - Case 1

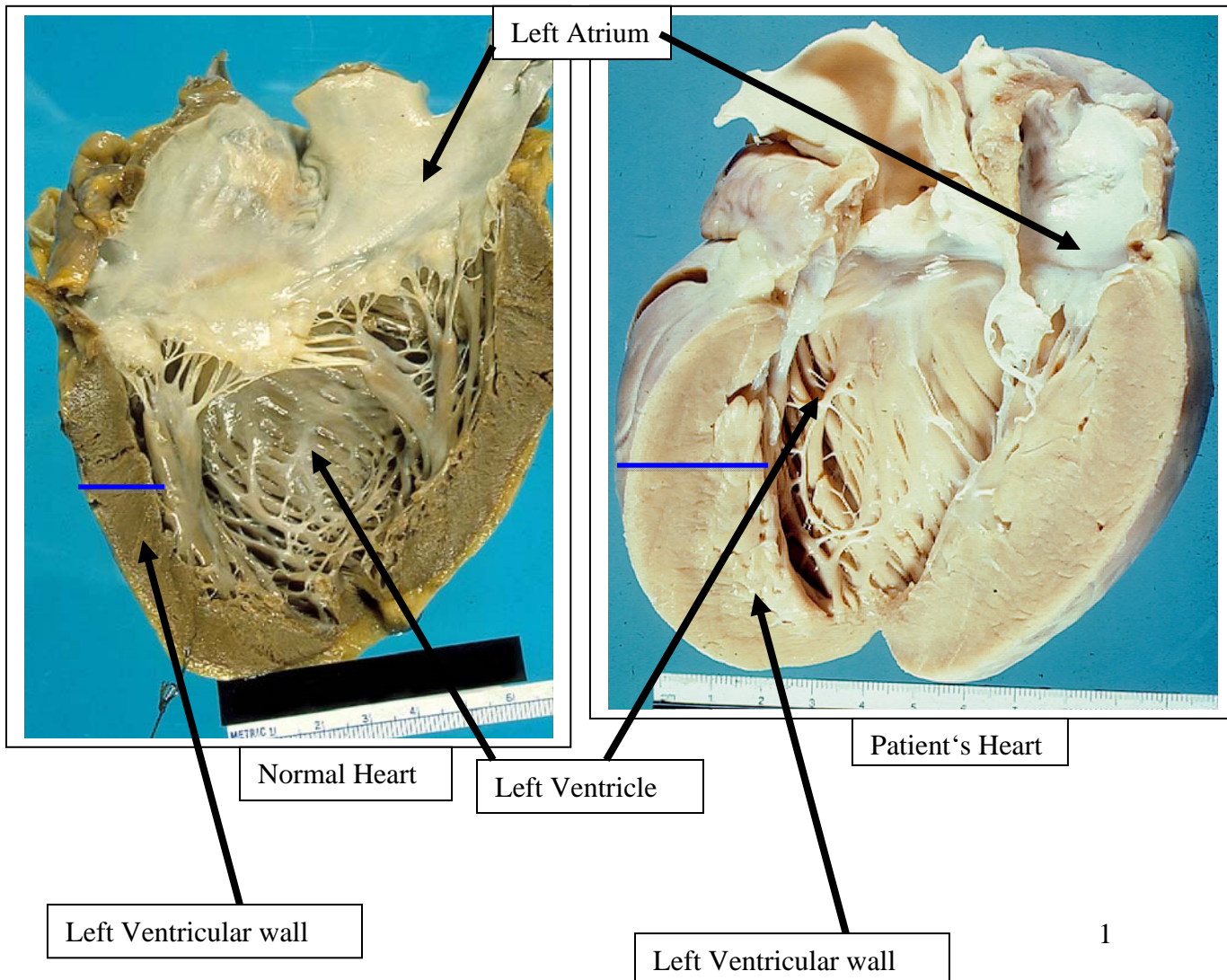
A 65 year old man with a history of tobacco use, diabetes mellitus and hypertension developed chest pain on exertion. On physical examination, his blood pressure was 180/105 mm Hg (this is too high; ideally BP should be 120/80 or lower), heart rate was 90 beats per minute (this is in the high-normal range; usually adult resting HR is 60 to 100 bpm...lower resting heart rates generally indicate better cardiovascular fitness), and respiratory rate and temperature were within normal limits. No murmurs were heard on auscultation of the heart. The cardiac apical impulse was shifted laterally (this indicates an enlarged heart).

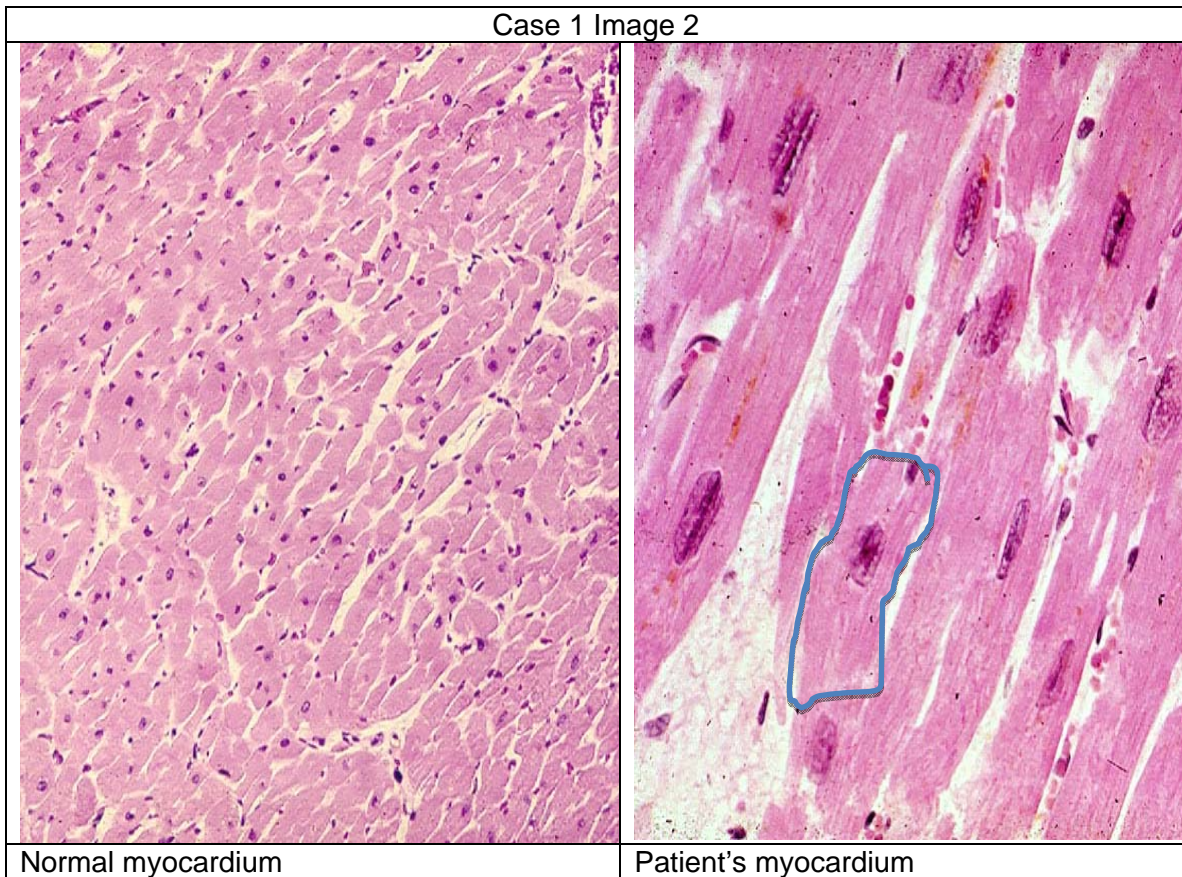
Laboratory studies including measurement of serum cardiac enzymes and troponin were within normal limits. A chest x-ray demonstrated enlarged size and abnormal contour of the heart shadow.

Instructions:

The images for your review are of normal heart and a heart with the changes that might be expected in this patient. Please answer the following questions, working as a team and referring to Robbins or online sources if needed. Be prepared to present your findings to the class.

Case 1 Image 1





Task 1. In image 1, compare the normal left atrium and ventricle (on the left), with the patient's left atrium and ventricle (on the right).

Use the rulers in the images to measure the thickness of the free wall of the ventricle. How do the measurements compare?

Task 2. What is the term that is used to describe this change in the patient's left ventricle?

What findings in the case summary correlate with this change?

Task 3. What risk factor(s) identified in the clinical history likely triggered this change in the heart?

Task 4. The muscular wall of the heart is called the myocardium. Image 2 demonstrates the normal histologic appearance of left ventricular myocardium on the left and the expected appearance of the patient's myocardium on the right.

What differences do you see in the cells and their nuclei?

Task 5. Which of the 4 forms of cellular adaptation (hypertrophy, hyperplasia, atrophy, metaplasia) is represented in this patient's heart? How do you think the patient's hypertension led to this cellular change?

Task 6. Identify the adaptation (hypertrophy, hyperplasia, metaplasia, atrophy) and whether it is physiologic or pathologic:

1. Cachexia in cancer
2. Exercise-induced muscle enlargement
3. Hormonally triggered breast development in puberty
4. Changes in bronchial epithelium due to smoking
5. Involution of intermediate structures during embryogenesis
6. Abnormal hormone production leading to endometrial growth
7. Cardiac muscle changes due to hypertension
8. Changes to the cervical cells due to lower environmental pH during sexual development

Task 7. Provide one more example of a cellular adaptation (it can be physiologic or pathologic and from any of the 4 categories)