Vague aches and pains in the bones in a child bearing age female will point towards osteomalacia and in a middle aged male towards multiple myeloma.

In short a brief history about specific complaints shall be a pointer towards reaching a diagnosis.

Past history

Information about major illnesses in the past are very essential. This may include history of any major accident, head injury, previous operations, childhood illnesses like exanthemata. Intake of any drug for long periods. History of recurrent asthmatic attacks in the past or frequent episodes of sore throat are important in diagnosing childhood asthma going on to adult stage in former and rheumatic heart disease in later case. One must pick out the relevant data from the past history and not lay stress on unnecessary facts.

Personal history

In this one has to specially ask about addictions to smoking, alcohol and drugs. The exact quantity of substances consumed and their duration be recorded. This is useful in cases of cirrhosis liver, peptic ulcer, chronic gastritis, polyneuropathy (Alcohol abuse) bronchogenic carcinoma, thromboangitis obliterans (excessive smoking).

Occupation of the patient is also helpful in some cases such as occupational lung disease, lead poisoning etc. Regarding marital status, and family environment a little enquiry is also helpful in telling about any psychological conflicts at home. Similarly in old people there are likely to be some major conflicts because a majority of them may be being neglected by their children.

Family history

There are certain diseases which run in families such as bronchial asthma, diabetes, coronary heart disease, hypertension etc.

So make a note about any major illness amongst the parents/grandparents and their cause of death.

Similarly presence of tuberculosis or any infectious ailment in the patients surroundings may point to the diagnosis.

Physical examination

Physical examination of the patient is important in reaching the diagnosis. It consists mainly of two forms:

1. General physical examination
2. Systemic examination

GENERAL PHYSICAL EXAMINATION

It means an overall assessment of the physical characteristics of the patient coming for examination.

It is important to observe the patient acutely (his or her gait, facial expression as the patient enters your office or if lying in bed the posture he adopts and whether he/she is comfortable or not. Thus a patient of renal/biliary colic shall be tossing in bed because of pain while a hemiplegic shall have one limb paralysed and unable to move. Facial expression like twitching (nervous tics, facial palsy, epilepsy) blank face (Parkinsonism) a vacant face with coarse features, lips large and subcutaneous tissue thickened (myxoedema) prominent eyes (exophthalmos) and lid retraction in thyrotoxicosis are important clues.

The built of the person is equally important. Generally there are three types of built.

Asthenic. Thin built, tall and long. More prone to suffer from tuberculosis.

Normosthenic. Normal body built.

Sthenic. Broad shouldered, fat and heavy built likely to fall prey to diabetes, hypertension, coronary heart disease.

IMPORTANT POINTS TO BE OBSERVED

In general, physical examinations are:

1. Eyes

For evidence of pallor (anaemia) congested (chronic cor pulmonale) puffiness of eye lids (nephrotic syndrome).

R waves or rSR' or RSR' complexes in left precordial leads (V4-V6), QRS complex more than 0.12 seconds, VAT more than 0.09 seconds in V4-V6, ST segment depression and T wave inversion in V4-V6. Extremity leads show pattern similar to V4-V6 in aVL (if heart is horizontal, in aVF if heart is vertical). Standard leads shall reflect the same pattern as in extremity leads.

Left bundle branch block (LBBB) presence alway signifies serious cardiac ailment like ischaemic heart disease, hypertension and aortic valve disease. A transient LBBB may occur in cases of acute myocardial infarction, acute myocarditis or in cases with digitalis toxicity.

Ventricular activation time (VAT)

It is the time which an impulse takes to travel from the endocardium to epicardial surface. It is measured from the beginning of Q wave to the peak of R wave. It is not more than 0.04 seconds.

S-T segment

This is the portion of the record between the S wave (J) to onset of T wave. It is usually isoelectric but may normally be slightly elevated upto 1 mm in limb leads and vary from –0.5 to +2.0 mm in precordial leads. Abnormal elevation or depression occurs in diseases involving myocardium like myocardial, infarction, subendocardial infarction, coronary insufficiency pericarditis etc.

Q-T interval

Q-T interval is measured from onset of Q wave to end of T wave and indicates duration of electrical systole the time taken to depolarize and repolarize ventricular myocardium. Q-T interval is rate dependent and is corrected according to heart rate (Q-TC) with the help of nomogram. Normal Q-Tc is 0.42 seconds in men and 0.43 seconds in women. It is altered in myocarditis, digiitalis toxicity.

T-wave

This is the deflection following a QRS complex and reflects ventricular repolarization. Normally it is upright but may be inverted in L3, aVR, V1. Flattening or inversion of T wave in precordial leads indicates myocardial ischaemia, pericarditis, myxoedema, myocardial infarction, myocarditis.

Exercise stress testing

It is a method employed in the diagnosis of chest pain and detection of ischaemic heart disease where basic electrocardiogram is normal.

Classically we have masters two step exercise test where two steps each nine inches high eight to 10 inches deep and 18 to 27 inches wide are used and the patient is instructed to walk up anddown the steps for a definite number of trips in one and a half minute. Criteria for a positive test include ST segment depression of more than 0.5 mm, change from an upright T to a flat or inverted T in any lead except LIII and appearance of cardiac arrhythmias. In patients where exercise test is normal, double two step test is performed where patient performs double the number of trips of single test in three minutes. Criteria for diagnosing positively of test remain the same.

Treadmill stress test (TMT)

Tread mill test is an important test and is done to evaluate cardiac function in a patient who is suffering from angina and his/her ECG is normal. It is not to be done in cases of unstable angina, uncompensated heart failure, fresh myocardial infarction, uncontrolled malignant hypertension, seriously ill patients and those with serious cardiac arrhythmias.

Stress testing is performed by walking on a treadmill with continuous monitoring of pulse, BP, ECG, heart rate and patients symptoms like chest pain, breathlessness. The exercise in this test is graded and the speed is gradually increased. If a patient can do more than nine minutes of exercise without any problem he is said to have good tolerance. Two common types of machines employed for stress testing are a bicycle ergometer or motor driven treadmill.

Stress testing tells us whether the coronary circulation is capable of increasing the oxygen supply

PHYSICAL SIGNS IN AORTIC STENOSIS

1. Low volume pulse or slow rising (anacrotic).
2. Apex beat is displaced downwards and outwards. Forceful, sustained and thrusting type. A systolic thrill is palpable in the aortic area.

   Auscultation reveals a loud pitched, ejection systolic murmur over the aortic area, radiating to the neck vessels. Second heart sound is soft.

Investigations. X-ray of the chest shows little or no cardiac enlargement when there is no or slight left ventricular hypertrophy. But later on as left ventricular hypertrophy takes place, there is blunt rounding of the lower left cardiac border.

There may be dilatation of the ascending aorta with post stenotic dilatation. There may be calcification in the aortic valve in cases of severe aortic stenosis. In late stage when left ventricular hypertrophy and dilatation takes place, heart size is enlarged and there is pulmonary congestion.

Electrocardiogram. It shows left atrial and left ventricular hypertrophy. Abnormalities of T wave in the form of inversions and ST segment depression in left ventricular leads are seen.

Conduction disturbances like left bundle branch block, intraventricular conduction defects, partial and complete heart block may be seen.

Echocardiogram. It demonstrates left ventricular hypertrophy and the nature of aortic valve and severity of stenosis. It is particularly useful for demonstrating other valvular abnormalities such as mitral stenosis and aortic regurgitation which may be present in association with aortic stenosis as well as measuring pressure gradient across the valve.

Cardiac catheterization. It is used to determine the gradient across the aortic valve which together with measurement of cardiac output can be used to calculate the size of aortic valve orifice and the degree of aortic valve obstruction.

Angiographic studies are helpful for delineating the size of left ventricular cavity, degree or aortic valve deformity and its mobility as well as for demonstrating obstruction in coronary arteries.

Complications of aortic stenosis. Left heart failure followed by congestive heart failure is important complication. Once it supervenes prognosis becomes poor.

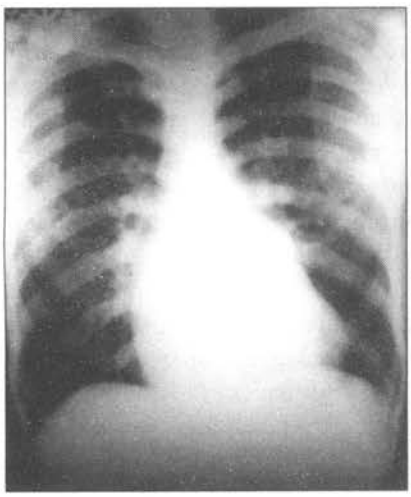

Fig. 4.17. X-ray heart (PA view). Mitralised heart

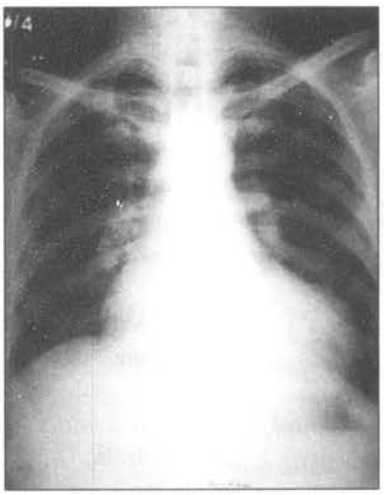

Fig. 4.18. X-ray heart (PA view). A case of valvular heart disease (aortic with left ventricular enlargement (boot-shaped heart)

Fig. 4.19. X-ray heart in a case with mitral and aortic valve disease. Note huge cardiomegaly

2. Acyanotic

Common cyanotic congenital heart lesions.

1. Fallot's tetralogy
2. Transposition of great vessels.
3. Tricuspid atresia
4. Persistent truncus
5. Pulmonary stenosis with reversed interatrial shunt
6. Pulmonary atresia.

Acyanotic congenital heart lesions:

1. Atrial septal defect
2. Ventricular septal defect
3. Congenital aortic stenosis (valvular, supravalvular, subvalvular)
4. Coarctation of aorta
5. Patent ductus arteriosus
6. Pulmonary stenosis (valvular, infundibular, supravalvular)
7. Tricusid stenosis

Common signs and symptoms in congenital heart lesions. Cases of cyanotic heart disease have right to left shunts where mixing of venous with arterial blood is taking place. In cass with left to right shunts (VSD, ASD, patent ductus arteriosus) as a result of development of pulmonary hypertension reversal of shunt takes place and subsequently these patients present with cyanosis (Eisenmanger's syndrome).

Most of the children present with poor growth, difficulty in feeding, syncopal attacks and recurrent respiratory infections. Blue baby is a classic example of a cyanotic heart disease. Cyanosis may appear in such children on crying. Breathlessness on exertion is a striking feature and may appear in paroxysms.

Forms of atrial septal defect

1. Ostium secundum
2. Ostium primum
3. Sinus venosus type

Squatting after exercise is common in Fallot's tetralogy and is the posture adopted by such children. Excessive weakness and persistent cough, cold extremities and numbness of limbs are other features. Cerebral symptoms include faintness, dizziness, syncope and convulsions and these are due to cerebral hypoxia.

The most common physical signs include cyanosis which in some is present since birth (Fallot's tetralogy) or appears later in life with reversal of shunt from left to right to right to left (Eisenmanger's complex). Cases with prolonged and persistent cyanosis have clubbing of the fingers and toes.

Complications. Common complications include congestive heart failure, subacute bacterial endocarditis. Paradoxical embolism, pulmonary tuberculosis and cerebral abscess.

Prognosis in a case of congenital heart disease depends on the underlying cardiac lesion, how early detected and whether it is amenable to surgery.

Atrial septal defect. It is the commonest form of congenital heart disease and is more common in females as compared to men. It may occur in isolation or in association with other anomalies like VSD, pulmonary stenosis, or mitral stenosis. Depending on the developmental defects, three types of defects are known.

1. Ostium secundum, commonest type of defect and is present in the region of fossa ovalis.
2. Ostium primum, a defect in the lower part of interatrial septum.
3. Sinus venosus type, a defect in the upper part of interatrial septum.

In an uncomplicated case of atrial septal defect, the shunt is from left to right due to increased left atrial pressure. Because of increased flow of blood from the right atrium to right ventricle, the chamber becomes large and hypertrophied. As a result of diastolic over load of right ventricle, pulmonary blood flow increases. Rise in pulmonary arteriolar resistance determines the magnitude of shunt and increased pulmonary blood flow.

Clinical features. A large number of cases of ASD remain asymptomatic for a long time but when