Heaves and Thrusts: how should I describe the apex beat?

Student question

Dear Dr Clarke,
I am finding it very hard to get my head around when the apex will be displaced, or whether there will be a tapping or heaving apex. I have looked on the internet for an explanation of this but cannot find it. Also should I auscultate the praecordium with both diaphragm and bell? If yes what is the explanation for it? Seems to me that it would take a very long time and I would have to keep switching between bell and diaphragm in each area of the heart.

Response

Tapping apex
The word tapping is used specifically for mitral stenosis where you feel a loud palpable first heart sound. In pure mitral stenosis, the apex is not displaced as the stenosis limits the amount of blood getting into the ventricle and so there is no excess of blood to make the ventricle dilate. Normally during diastole, blood is flowing from atria to ventricle and the ventricle is filling up, causing the open mitral valve leaflets to glide towards the closed position. But here, the high left atrial pressure keeps the valve open until the last minute: the beginning of systole when the ventricular contraction slams it shut, causing a loud first heart sound- so loud that it is palpable as a tapping apex.

Heaves and thrusts
“Heaving”, “thrusting” and “hyertrophied” are terms that are sometimes used to describe the apex: I don’t like these terms much so I try to keep it simple by stating that the apex is or isn't displaced and is or isn't forceful.

Pressure overload
Pressure overload (eg hypertension or aortic stenosis) will typically cause an apex to be forceful but not displaced. This is because the thickening of the ventricular wall occurs “inwards” encroaching on the ventricular cavity, which becomes slit-like. This means that typically the apex beat will not be displaced.

Volume overload
By contrast, a valve leak will cause the ventricle to become dilated due to the extra volume of blood within it eg mitral regurgitation and aortic regurgitation. This is manifest as a displaced apex that is not particularly powerful, because the ventricle has responded by dilating rather than thickening its wall.

Auscultation
Ideally this should be with bell and diaphragm in all areas; typically a cardiologist will take a short cut and listen with the bell everywhere, as that picks up nearly everything, and then will follow up with the diaphragm at the left sternal edge with the patient sitting forward at the end of expiration. This is because the one specific sign that the bell is not good at picking up is the high pitched murmur of aortic regurgitation. Remember there is acceptable variation in how this is done, but you should be sure to include two specific manoeuvres at some stage:
1) patient on left hand side listening with bell at apex for mitral stenosis and
2) patient sitting forward listening with the diaphragm at the left sternal edge for aortic regurgitation