

# **Valvular diseases and murmurs**

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# Etiology

## 1- Acquired :

- Endocarditis
- Endocardiosis
- Rapture of chordae tendinea
- Laceration or detachment of aortic valve leaflets.
- Dilatation of the right atero ventricular valve .

## 2- Congenital.

- Pulmonary valve stenosis .
- Blood cyst are common on the aterio - ventricular valve of cattle can occur congenitally.

# Pathogenesis

- The important clinical indication of Valvular diseases are **audible murmurs** and pericardial thrill.
- **Murmurs** may occur at any phase of cardiac cycle and **are caused by vibration of turbulent flow of blood transmitted to the surface of the chest.**



- The severity of the turbulence and hence the murmurs can be increased with higher flow velocities such as occur with exercise and by factors that decrease blood viscosity such as anaemia and hypoproteinemia

# Examination of Murmurs

When murmurs is detected it should be categorized according to its **timing & duration, intensity, location and character.**

## **1- Timing allow subdivision :**

**a- Systolic .**

**b- Diastolic .**

**c- Continuous .**

There is little problem in differentiating systolic from diastolic murmurs at slow heart rate because of the temporal difference between the length of systolic and diastolic periods.

However where is a murmur present at fast heart rate this distinction is less obvious and it possible to misclassify the period of cycle in which murmur is occurring .

## **Systolic murmurs**

Are associated with stenosis of the outflow valves and insufficiency of the ateroventricular valves.

## **Diastolic murmurs**

Are associated with insufficiency of the outflow valves or stenosis of ateroventricular valves.

## **A continuous murmur**

Is one that occurs during both systole and diastole may be associated with both stenosis and insufficiency of the same valve or with multiple Valvular lesions, but more commonly results from the turbulent flow of blood from high to low pressure system with on intervening valve such as occurs with patent ductus arteriosus.

## Duration

during systole or diastole is determined by a careful examination of the murmur with relationship to systolic murmurs are further classified as **early, late or pan systolic.**

## **2- intensity**

Intensity or loudness of murmurs provides a guide to its significance . A system of grading the intensity of murmurs that been found to be of clinical value is as follows.

**Grade I:-** The faintest audible murmurs.

Generally only detected after careful auscultation.

**Grade II :-** A faint murmurs that is clearly heard after only a few seconds auscultation.

**Grade III :-** A murmurs which immediately audible as soon as auscultation began and is heard over a reasonably large area.



**Grade IV :-** An extremely loud murmur accompanied by pericardial thrill .

The murmur become inaudible if the stethoscope is held with only light pressure on the chest.

**Grade V :-** An extremely loud murmur accompanied by pericardial thrill .

The murmur can still be heard when the stethoscope is held with only light pressure against the chest.

**Grade I** murmurs are not clinically significant whereas grade IV and V are invariably significant.

The significance of grade II and III murmurs varies according to their cause.

The presence of pericardial thrill is determined by palpation over the point of maximal intensity of the murmurs and palpation on the chest over the area of the heart .

A pericardial thrill indicate that there is a considerable energy generated by the turbulent flow and defines the intensity of the murmurs in the top two grads of grading system.

## **3- Location**

Location and radiation of murmurs is related to its area of generation and transmission.

## 4- Character

Character is determined by change in intensity during the duration of murmur and defined as:

crescendo, crescendo –decrescendo,  
decrescendo and plateau

murmurs also described as:

blowing, harsh , musical & sighing.

# **Insufficiency of the right ateroventricular valve.**

Tricuspid valve insufficiency resulting from endocarditis is the most common acquired valvular lesion in cattle.

Insufficiency may also result from dilatation of the valve annulus in chronic anemia.

Tricuspid regurgitation can also occur with general heart failure that follows left sided failure.

There is harsh holosystolic or pansystolic plateau type murmurs most audible over the tricuspid valve area.

Loud murmurs project dorsally and to the cranial part of the thoracic cavity on both right & left sides.

The murmur is usually accompanied by exaggeration of the systolic component of the Jugular pulse.

Congestive heart failure (if it occur) will be manifest in the greater circulation.



# Insufficiency of the left atero- ventricular valve

- It is the second most common acquired valvular disease in horses , cattle and pigs
- The insufficiency may result from endocarditis or rapture of the mitral valve chordae.
- There is a loud harsh holosystolic or pansystolic murmurs that is most intense in the mitral area.

- The murmur **transmits dorsally** and in severe cases may also be heard on the right side.
- Frequently occurrence of the third heart sound which may be before the second sound.
- A late systolic crescendo murmur has been associated with mitral insufficiency.

# Insufficiency of the aortic valve

- This is a most common acquired valvular defect in horses.
- There is a loud diastolic murmurs frequently accompanied by thrill caused by the reflux of blood from the aorta into left ventricle during diastole

- The murmur is generally audible over the left cardiac area and is most intense at the aortic valve area and radiates to the apex.
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- The murmur may be noisy or musical and the relative intensity varies from horse to horse.

# Stenosis of the aortic valve

- There is harsh systolic murmur most audible high up over the base of the heart of the left side and posteriorly.

- The murmur replaces or modified the first heart sound and is often crescendo and decrescendo in character.
- A systolic thrill may be palpable over the base of the heart and the cardiac impulse is increase due to ventricular hypertrophy.

- The stenosis has most functional significance when the pulse is abnormal.
- There may be signs of left sided heart failure and this lesion may be associated with syncope.

# Stenosis & insufficiency of the pulmonary valve

- Acquired lesions of this valve are rare in large animals.
- The auscultatory characters are similar to those produced by aortic valve lesion but there are no abnormalities of the arterial pulse.



- Pulmonary stenosis produce a distinct murmur at the **third intercostal space** on the right side of the chest.
- Murmurs may also be **audible anterior to the aortic valve area** on left side of the chest.
- Heart failure if it occurs is right sided.

# Stenosis of the right or left ateroventricular valve

- Stenosis of the right ateroventricular valve  
**uncommon**
- There is diastolic murmur caused by passage of blood through a stenosed valve during diastolic filling and audible over **the base of the heart** on the relevant side.

- The severity of the lesion will govern the duration of the murmur but there is likely to be presystolic due to aortic contraction.
- Right aorticventricular valve stenosis may be accompanied by accentuation of the aortic component the Jugular pulse.

# Clinical pathology

- Clinicopathological findings will reflect the change caused by the primary disease and are significant only when there is endocarditis.

- Two dimensional **echocardiography**, **Doppler echocardiography** and **color flow Doppler echocardiography** are the most valuable non invasive methods for examination of valvular diseases and allow a detection of the defect, its nature and severity.

# Treatment

- There is no specific treatment of valvular diseases.
- Methods for the treatment of congestive heart failure and endocarditis may be used

**Thank you**