Male Infertility and Reproductive Diseases

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Introduction

- Fertility denotes ability to sire progeny
- Complete inability to sire progeny is referred to as sterility – easy to determine
- Impaired/Reduced ability to sire progeny referred to as infertility difficult to establish
- Judgment of infertility requires knowledge of the circumstances of the animal's use for breeding, and the expectations that have been placed upon its performance
- The following reflect potential scenarios for misjudging infertility
  - Immature Bull used for breeding – reduced fertility
  - Rams and Bulls working at high female : male ratios in short mating periods
  - Bull used for breeding under stressful

Male Fertility Impairment

- The fertility of male animals is related to several phenomena: Sperm production, viability and fertilizing capacity of the ejaculated sperm, sexual desire (libido) and ability to mate.
- Conditions that cause impairment of fertility in

Category	Underlying Abnormalities
A. Failure of normal service (impotentia coeundi)	1. Conditions causing unwillingness or inability to mount 2. Conditions that prevent normal copulation from occurring, despite normal libido
B. Failure of fertilization/conception after normal service (impotentia generandi)	1. Diseases of the test is (including abnormalities of spermatogenesis), epididymis and accessory glands

- Management problems associated with both

A. Failure of normal service (impotentia coeundi)

1. Unwillingness or Inability to Mount

- Unwillingness to Mount reflects a lack of libido
- Lack of libido may be hereditary or may originate from psychogenic disturbances, endocrine imbalance or environmental factors
- Physical problems which cause inability to mount may also lead to impaired libido
- **Underlying causes**
  - Immaturity or inexperience and Aging
  - Poor service management (slippery floors, too low roofs and intensive handling by stock persons)
  - Lesions affecting locomotion impair ability mount and subsequently willingness (libido) to mate; hind limbs joint lesions, overgrown hooves, any lesion of the trunk, rupture of lumbo-dorsal fascia 'honeymoon back‘ in young over-zealous bulls,
  - Abnormalities of hind limb conformation impair ability to mount Eg. bulls whose hocks are over-

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Management of unwillingness or inability to mate entails addressing the underlying cause

- Immature males should be provided exercise and plentiful supply of estrous females to develop their abilities Large doses of hCG (5000-10000 iu) or GnRH may stimulate libido (has side effects like aggression as on libido and testicular oedema, Not recommended)
- Aged animals should not be used for breeding
- Correction of service management problems
- Treatment of locomotion problems; cut overgrown hooves, alleviate painful conditions with analgesics and nursing care

2. Inability to Mate/Copulate

- Inability to copulate is a relatively frequent cause of infertility in animals
- Failure to copulate may involve abnormalities that prevent penile; **Erection, Protrusion and Intromission**

- **Potential underlying causes include, but are not limited to;**
  - ¬ Rupture of the CCP
  - ¬ Lesions of prepuce and penis
  - ¬ Congenital defects of penis
  - ¬ Persistent Penile Frenulum
  - ¬ Penile - Perpetual adhesion
  - ¬ Phimosis & Paraphymosis
  - ¬ Penile deviations

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- **Abnormal venous drainage of the CCP**

¬ Rare condition associated with erection failure in young bulls & some times boars

¬ Cause - Congenital development of ectopic veins that drain the CCP.

¬ The CCP is not blind-ending and could not become turgid and the penis therefore remains flaccid .

¬ Affected animals have normal libido and are eager to mount but never achieve erection or intromission

¬ Observation of the mating behavior of such bulls reveals excessive ischiocavernostis muscle activity before and during mounting, such that the tail head appears to be 'pumping' up and down

¬ Difficult to manage by surgery - Salvage by slaughter

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- **Occlusion of the longitudinal canals of the penis**
- During erection of the bovine penis, increased blood pressure produced by ischiocavernosus activity is transmitted throughout the length of the CCP by the **longitudinal canals.**
- Congenital absence or acquired blockage of longitudinal canals of the penis therefore prevents erection
- Although the great majority of the penis is flaccid, a short length of turgid tissue is present, in the part of the penis proximal to the occlusion on palpation beneath tail head
- This condition also occurs in rams, in which the CCP can rupture proximal to the site of obstruction, causing a peri-penile haematoma in the region of the

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- **Rupture of the CCP**
- Most common abnormality associated with erection failure and loss of sexual drive in animals
- Other names- **ruptured penis, fractured penis and broken penis**
- **Pathogenesis and Clinical features**

¬ Rupture of the tunica albuginea & CCP occurs if pressures within the CCP rise substantially above the pressures achieved during normal copulation Eg. the cow moving suddenly at the moment of intromission/ejaculation,

¬ In bulls most commonly either in the region of the insertion of the retractor penis muscle, or on the dorsal aspect of the distal sigmoid flexure.

¬ In the rams, the rupture of CCP occurs near to the roof of the penis, above the proximal sigmoid flexure

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- Erection is not possible and animal will immediately refuse to make further attempt to mate
- Shortness of gait and general indications of mild discomfort.
- Haemorrhage occurs from the site of rupture, with haematoma collecting in the surrounding tissues (cranial to the scrotum in ruptures of the distal sigmoid flexure, behind the scrotum with proximal ruptures).
- Distal ruptures are also characterized by preputial oedema may leads to eversion of the preputial mucosa or prolapse of penis.
- If the haemotoma untreated, may develop abscesses (infection) or fibrous adhesions between the penis and prepuce.

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Management

- Conservative treatment, consisting of sexual rest for 90 days, with initial antibiotic therapy to prevent abscess formation and daily massage of affected area to limit formation of peri-penile adhesions.
- In the larger haematoma with abscess formation and

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- **Rare abnormalities that prevent protrusion of penis**
- Congenital failure of retractor penis muscle development – hereditary
- Congenital or pre-pubertal failure of penis to grow – Short Penis will not protrude significantly from prepuce
- **Persistent Penile Frenulum (PPF)**
- Penile Frenulum – CT connecting integuments of penis and prepuce in the fetus (breaks down during the prepubertal period)
- PPF is most frequently encountered in bulls that were reared in isolation, which have never had the opportunity to indulge in the calf hood riding behavior that normally causes stretching and

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- PPF prevents proper protrusion of penis, such that only a few cm’s appear through the preputial orifice & penis appear ventrally deviated ('rainbow' deviation)

Management

Transecting PPF after ligating any prominent frenular blood vessels gives a good prognosis for the recovery of breeding ability.

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- **Corkscrew penis (spiral deviation)**
  - ¬ Is the most common type of penile deviation in bovine
  - ¬ Hereditary origin
- **Pathogenesis & Clinical features**

¬ Spiraling of the tip of the penis is a normal part of the process of ejaculation in the bull, occurring after intromission.

¬ Premature spiraling occurs in most bulls as the tip of the penis touches the hindquarters of the cow.

¬ Commonly observed in animals in their second or third season of breeding

¬ It may be intermittent at first with progressive worsening

¬ Continual premature spiraling can result in the trauma and pain leads to ulcer on the glans penis

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Management

- Detection is based on absence of the characteristic ejaculatory thrust
- The spiral deviation can be alleviated by suturing the dorsal apical ligament to the tunica albuginea (catgut and stainless steel). But not recommended due to hereditary origin

Lateral Deviation of Penis

Lateral deviation of the penis is often attributed to injuries to the tunica albuginea but may arise from inadequate development of the dorsal apical ligament of the penis or congenital defects of the tunica albuginea. Treatment is generally unrewarding

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- **Preputal Eversion and Trauma**
- **Pathogenesis & Clinical features**

¬ In bull, intermittent protrusion of varying lengths of preputial mucosa is a normal event

¬ Pathological eversion of the prepuce is associated with aplasia or hypoplasia of the retractor muscles of the prepuce, which normally stabilize the preputial mucosa during penile movement

¬ The mucosal segment closest to perpetual orifice are commonly everted and exposed to physical injuries and acute inflammation (hyperemia, edema, heat) – this may hamper libido, erection & protrusion

¬ Unless replaced soon after eversion, the mucosa may become permanently prolapsed, with severe and diffuse fibrosis and thickening, often with chronic scare tissue or adhesion – prevent protrusion of penis

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Management

- ¬ Acute cases may be treated with application of emollient dressings and replacement of the everted organ
- Chronic cases may be requires surgical removal by either sub-mucosal resection or amputation of the prolapse if the fibrotic change extends deep
- Circumferential incision is made in the outer layer of preputial mucosa, after which the dissection is then deepened so as to excise all the fibrotic tissue before the inner membrane of the prepuce is cut
- Attention to excessive bleeding
- Close free ends with interrupted

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- **Balanoposthitis**
- Infection of the penis (Balanitis) and prepuce (posthitis) are common in the dog, bull and ram
- Severe balanoposthitis can cause pain, unwillingness to mate or inability to copulate
- **Pathogenesis and Clinical features**
- Severe balanoposthitis is associated with microbial infections
- Opportunistic bacterial infection (particularly Escherichia coli)
- Specific infectious agents
- Dogs - canine herpes virus infection
- Bulls - infectious with bovine rhinotracheitis – infectious pustular vulvovaginitis (IBR – IPV), BHV -1
- Rams - *corynebacterium renale*, Orf

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- Mild balanopasthitis may only exhibit a mild sero-purulent exudate
- Severe balanopasthitis leads to acute ulcerative and purulent lesions on the penis and prepuce with intense pain which will impair willingness to mate
- Chronic inflammation leads to scabbing and adhesion of penile and preputal integument, stenosis of prepetual orifice - this prevent protrusion of the penis and intromission (failure to copulate)
- Severe prepetual stenosis may block urination and lead to serious uremia and even death
- In case of dourine in equines - initial sign is oedema of prepuce, penis scrotum and surrounding skin (may lead to paraphimosis). Inguinal lymph nodes are enlarged and mucopurulent urethral discharge may also be present. Death can occur as the consequence of vascular degeneration and peripheral nerve degeneration (paralysis)

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Management

- Wash affected areas with warm water antiseptic solution on weekly basis – to prevent or resolve opportunistic infections
- Systemic antibiotics and anti-inflammatory agents
- Provide sexual rest and nursing care
- Protect exposed parts from further physical injury – shaving wool,
- Dourine – early treatment with trypanocidal drugs

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- **Phimosis**

¬ Phimosis indicates a stricture of the preputial orifice that prevents the penis from being protruded.

¬ It may arise from the injuries and congenital detect particularly in the dogs (German shepherd and golden retriever breeds)

¬ Affected puppies may be unable to urinate adequately with balanoposthitis leading to septicaemia and death

¬ Treatment may by removing a wedge of preputial skin, fascia and mucosa from behind the ventral aspect of orifice of prepuce. Mucosa and skin are then sutured together.

- **Paraphimosis**

¬ Paraphimosis denotes an inability to withdraw the penis into the prepuce

¬ The condition is most common in the dog and the stallion (may occur in the other domestic species)

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- **Pathogenesis and Clinical features**
- Results from congenital or acquired strictures of the prepuce, paralysis of penis and from balanoposthitis
- In the dog, paraphimosis following copulation or spontaneous erection. It may also occur when the preputial opening becomes constricted by a band of hair, preventing return of penis to the prepuce
- In the stallion, prolapse of the penis is the sequel to many conditions. For examples: after the administration of phenothiazide tranquilizers, follow exhaustion and severe systemic illness, terminal stages of disorders of the CNS, secondary to the preputial oedema follows castration and commonly occurs after injury to the penis.
- Two main pathological effects ensue following paraphimosis
  - Physical injury – inflammation (acute – chronic) and 2º

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Management

- In the early cases, the penis can be returned to the prepuce with careful manipulation and plentiful lubrication.
- The surface of the penis must be protected by the use of ointments to prevent drying. The penis must be supported by made of nylon stocking material appropriately slung around hindquarters – prevent physical injury.
- Oedema may be relieved by use of cold packs and exercise (early), or using anti-inflammatory drugs and diuretics (later)
- If the penis becomes severely swollen or strangulated, the preputial orifice may be enlarged surgically
- If necrosis and gangrene is extensive amputation of


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- **Penile neoplasia:-**

¬ Virally induced **fibro-papillomata** of penile integument are common in young cattle. The tumour may be single or multiple, sessile or penduculated.

¬ **Squamous cell carcinoma of glans penis and sarcoid** are also common in the horse.

¬ **Transmisable Veneral Tumor (TVT**) is a common condition in dogs –

¬ Clinical effects vary according to the size and morphology of the lesions. Haemorrhage and ulceration are the most common sequelae, the pain may leads to impair libido.

¬ Large lesions can prevent retraction of the protruded penis (traumatized and infected).

¬ Rapid growth of penile tumours within the preputial cavity can result in compression of the urethra, which may even rupture with infiltration of urine into per penile tissues.

¬ Benign tumors may be removed surgically

¬ TVT chemotherapy with vincristine

Penile fibropapillomata in the bull.



Squamous cell carcinoma and Melanoma in stallion

Transmissible venereal tumor in dog

Ejaculation Failure

- Failure to ejaculate after normal mating is not a common cause of infertility
- Such conditions can be broadly divided into two groups
- Impairment of ejaculation reflex due to some damage to the neural pathways between the glans penis and the spinal cord, strangulation of the penis, with ensuing damage to the sensory dorsal nerve of the penis, and compression of the spinal nerve roots by age-related exostoses
- Impairment of ejaculation due to localized pain

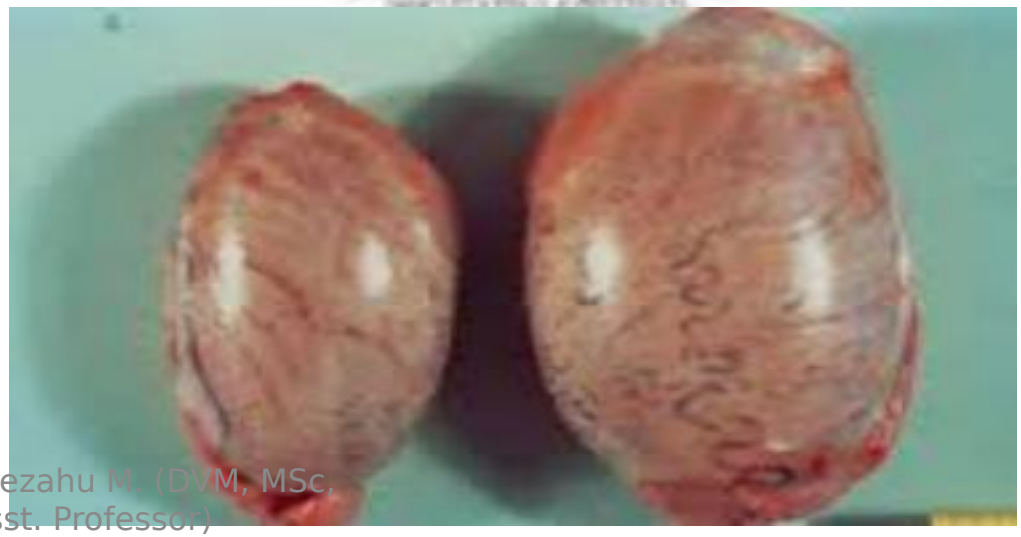
  Localized peritonitis in the caudal abdomen of ruminants causes pain during the ejaculatory thrust, so affected animals are often willing to mount but less wiling to ejaculate.

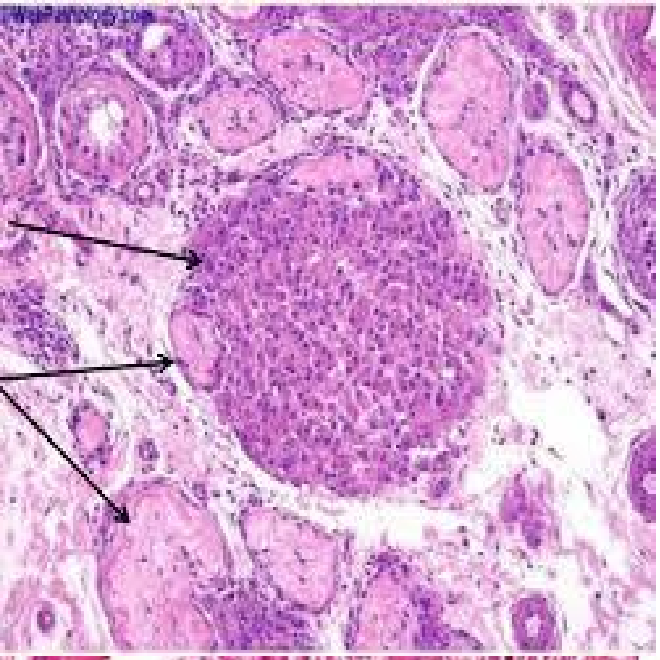
  Animals with back pain behave similarly, although they may be less willing to mount.

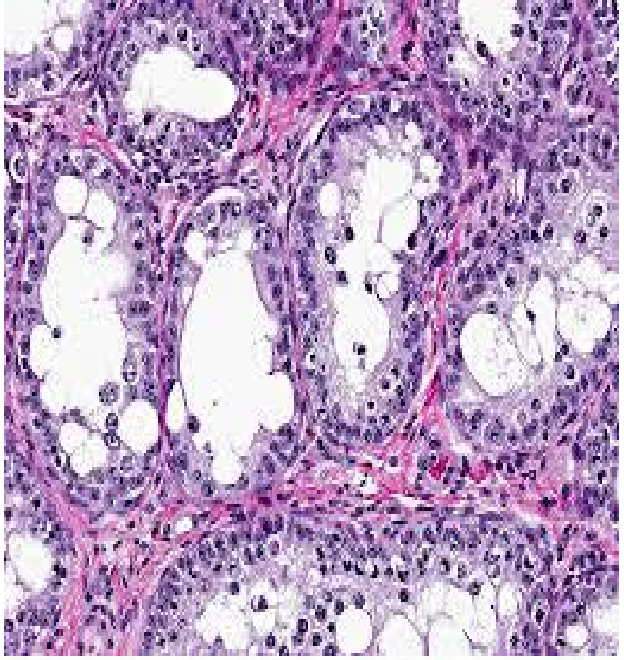
  Finally, some painful conditions of the penis, such as orf in rams, make the animal unwilling to achieve intromission and ejaculate, despite their willingness to mount.

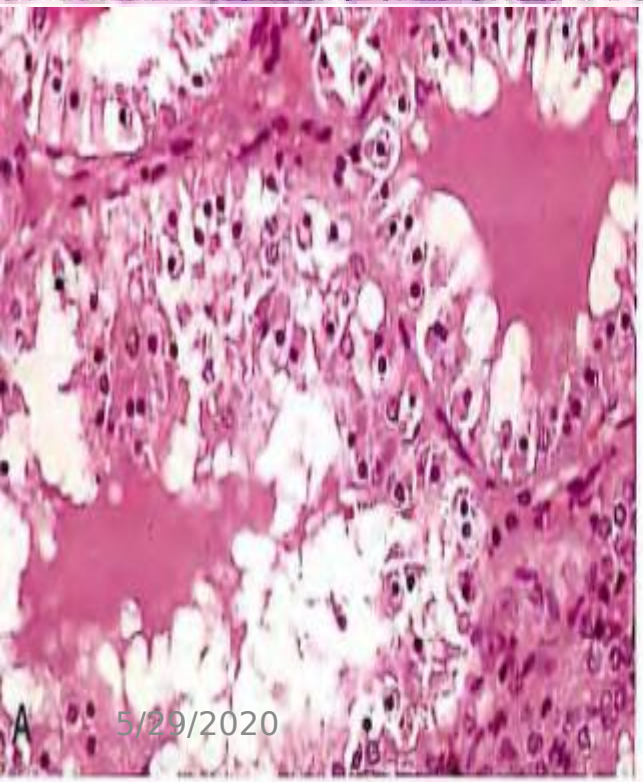
Fertilization/Conception Failure

- Diseases and abnormalities of testis and epididymis
- Diseases of the accessory sex glands
- Lead to impairment of sperm production or abnormality in composition of semen which compromise sperm viability
- ..\Notes\lecture 111\Lecures\Conditions causing failure of fertilization.doc





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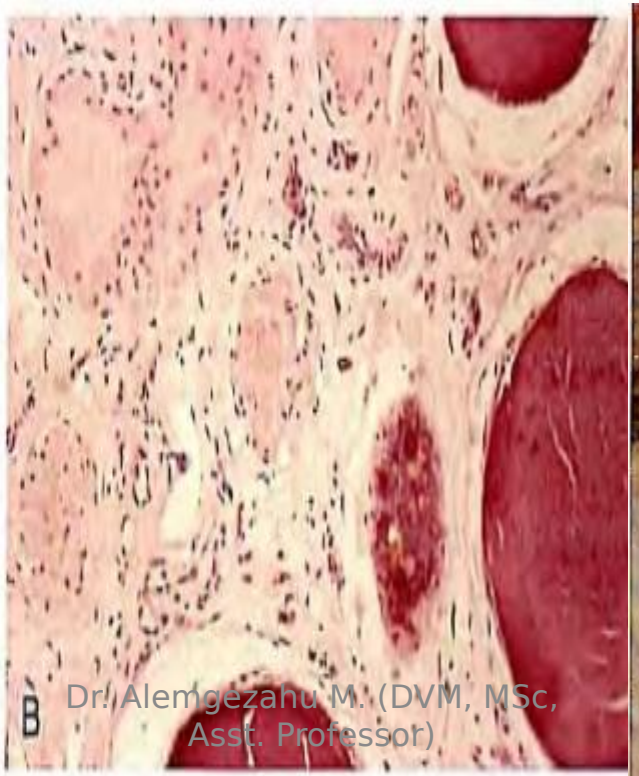
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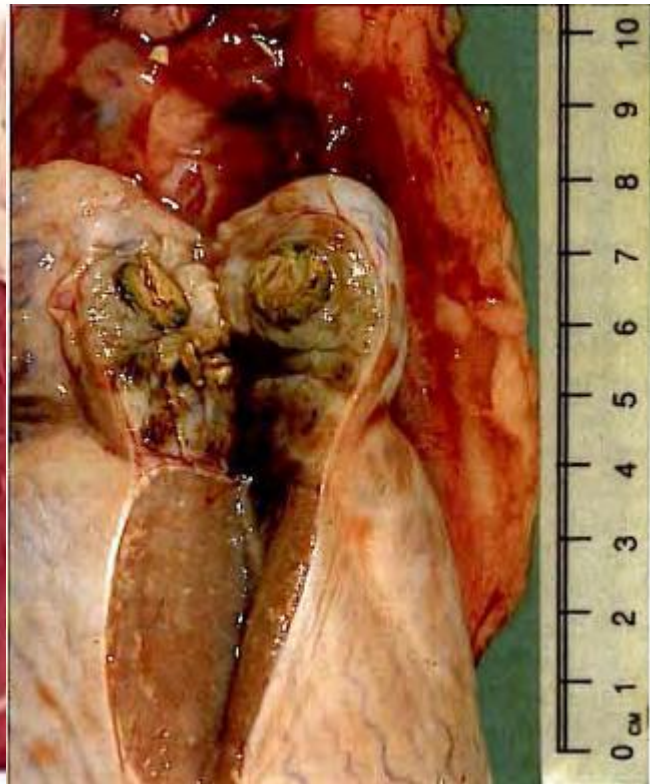
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