

## ABORTION AND STILLBIRTH

- ▶ It will be apparent from the foregoing discussion that diseases of the conceptus may result in death with resorption, fetal mummification, abortion, or stillbirth, depending on the age of the conceptus and the species involved, but not all fetal infections result in fetal death.
- ▶ Some viral infections appear to cause little harm to fetuses, at least during certain stages of gestation, and in some the effects are subtle. Many fetal diseases, such as brucellosis of cattle and sheep, epizootic bovine abortion, and mycotic fetal infections in cattle are chronic and may lead to the premature delivery of small-for-gestational age and diseased fetuses.

## ABORTION

- ▶ Abort is the discarding of the photograph before reaching the necessary development to live.
- ▶ The aboted fetus may be alive or dead at the time of the abortion, but is usually dead.
- ▶ Disposing of the dead fetus in the developmental stage of life can be called stillbirth
- ▶ If a live fetus is born before the expected time, it is also called premature birth.

### Causes Abortion:

- ▶ Non-infectious causes
- ▶ Infectious causes (Approximately 95%)

## Non-infectious abortions

They are not easy to identify and there are also differences between animal species.

- ▶ **Cows:**
- ▶ Nitrates
- ▶ Çavdar mahmuzu
- ▶ Toxins of mucotoxins
- ▶ Yellow pine needles or lupines
- ▶ Selenium deficiencies and redundancies
- ▶ Long-term transportation
- ▶ Environmental temperature

## In horses:

- ▶ Twin pregnancy
- ▶ Premature placental separation
- ▶ Insufficient placentation
- ▶ Umbilical cord anomalies (Torsion, strangulation)
- ▶ Villous atrophy
- ▶ Fescue (fungi called *Acremonium coenophialum*) toxication

## INFECTIOUS ABORTUS

- ▶ Bacterial Causes
- ▶ Viral Causes
- ▶ Protozoer Causes

## Diagnosing the infectious causes of abortion

- ▶ Not all of the infectious causes can be recognized by the examination of fetuses and placentas.
- ▶ The effects of infectious and noninfectious causes may be manifest indirectly through the dam or directly through the placenta and fetus.
- ▶ Conditions in the dam affecting the fetus and placenta and which may result in abortion include hemoconcentration, circulatory failure, anemia, fever, endotoxemia, and respiratory disease.
- ▶ With these conditions, no lesion of diagnostic value will be found in the fetus or placenta.

- ▶ Pregnant animals may contact infectious agents by many routes: through the respiratory tract, vagina, mouth, or, if insect-derived, through the circulation. Some agents may be carried into the reproductive tract with the semen or embryo
- ▶ transfer fluids.
- ▶ In cattle, *U. diversum*, bovine herpesvirus 1 (BoHV-1), and bovine viral diarrhea virus (BVDV) may contaminate either of these, and being preserved by freezing and resistant to the antibiotics commonly used, they survive there.

## Brucellosis

- ▶ Bacteria of the genus *Brucella* are small, gram-negative bacilli or coccobacilli that are strictly parasitic, prefer the intracellular habitat, and produce in animals chronic infections with persistent or recurrent bacteremias typically manifested by abortion.
- ▶ Three classic species of *Brucella* were described and define originally largely on the basis of host of origin—*B. melitensis*, goats; *B. abortus*, cattle; and *B. suis*, swine—but now by biochemical and serologic reactions.

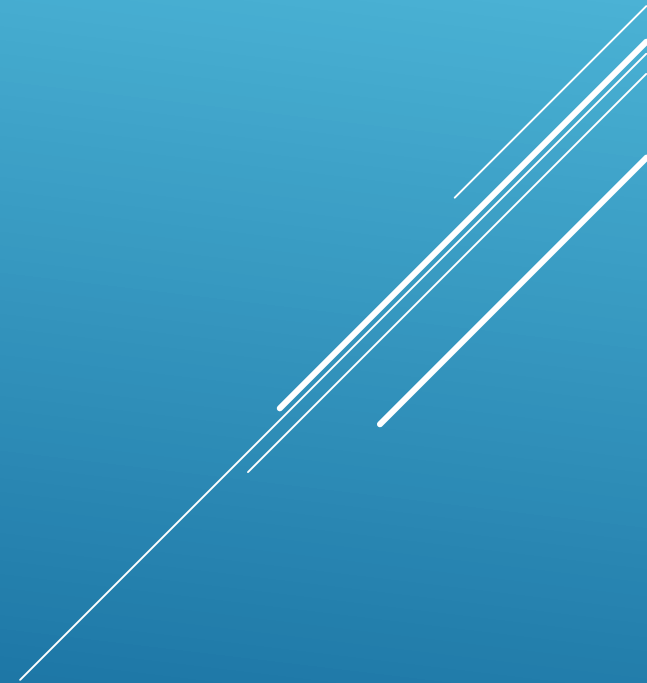


- ▶ Coital infection can occur but is uncommon, especially if genital infection in the male is long standing, possibly because fewer organisms are excreted in semen from chronic lesions.
- ▶ Infection can be transmitted at artificial insemination if semen from infected bulls is used. Irrespective of the route of infection, the **development and establishment of infection are probably comparable and will depend on the age and reproductive status of the animal, its inherent resistance, and on the dose and virulence of the infecting strain of the organism.**
- ▶ Young cattle are relatively resistant up to about the age of puberty. They can be infected by the usual routes and means, including the ingestion of milk in which the organisms are intermittently excreted. Calves normally eliminate infection in a few months.

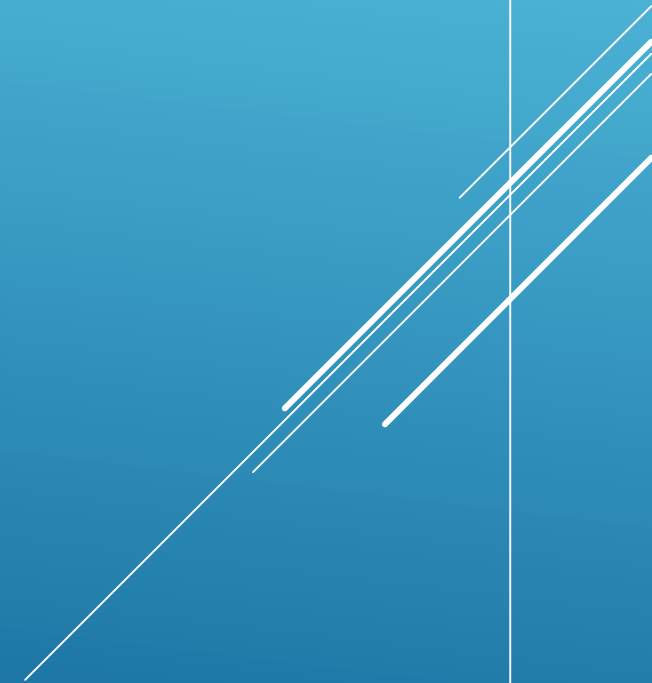
- ▶ **Gross lesions** in the placenta are characteristic but not
- ▶ pathognomonic; similar lesions of lesser or equal severity may
- ▶ be caused by other bacterial infections, and fungi produce
- ▶ similar lesions, usually of greater severity.
- ▶ There is considerable variation in the severity of the placental lesions, and this is reflected to some extent in the course of the local infection.
- ▶ If the lesion is severe, abortion or premature birth is the likely
- ▶ outcome, and if the lesion is of minor severity, the calf may
- ▶ be delivered normally at term and be viable or nonviable. The
- ▶ intrauterine lesions apparently progress very slowly, because
- ▶ an interval of many months may elapse between infection and
- ▶ abortion or normal birth.

- ▶ The external appearance of an infected pregnant uterus is
- ▶ normal. Sometimes the placenta is normal. Typically, between
- ▶ the endometrium and chorion in the intercotyledonary area, there
- ▶ is more or less abundant exudate that is odorless, dirty yellow,
- ▶ slightly viscid and slimy, and which contains gray-yellow,
- ▶ pulpy floccules of detritus. The fetal membranes and the
- ▶ umbilical cord are saturated with clear edema fluid, and the
- ▶ membranes may be 1.0 cm or more thick. The fetal fluids are
- ▶ usually normal, although occasionally fluid in the amnion is
- ▶ viscid and stained with meconium as the lesion extends.

- ▶ The placental lesions are not uniform; some cotyledons may
- ▶ appear more or less normal, and others will be extensively
- ▶ necrotic, whereas still others are diseased to intermediate
- ▶ degrees. Similarly, the intercotyledonary placenta varies in the
- ▶ extent to which it is changed, lesions being most prominent
- ▶ adjacent to the cotyledons. Affected areas of intercotyledonary
- ▶ placenta are thickened with yellow gelatinous fluid, opaque
- ▶ and tough, and the normal smooth glistening surface takes on
- ▶ an appearance resembling yellow-to-gray Morocco leather
- ▶ with, on the surface, a patchy coagulum of inflammator
- ▶ exudate and desquamated, degenerate epithelial cells. Affected
- ▶ cotyledons or portions of them are necrotic, soft, yellow-gray,
- ▶ and may be covered with the sticky, odorless, brown exudate.



- ▶ Histologically, the lesions produced within placental
- ▶ tissues by Brucella bacterial infection is very similar between
- ▶ species. The chorionic epithelial cells are stuffed with bacteria
- ▶ and many of them, with their inhabitants, desquamate
- ▶ into the intercotyledonary space. Edematous placental
- ▶ stroma contains increased numbers of leukocytes, largely
- ▶ mononuclear but with some neutrophils. The organisms in
- ▶ intact trophoblasts are cocci, but free in the exudates; they
- ▶ assume a more elongate form even while still contained within
- ▶ the ghosts of dead trophoblasts. Within placentomes, the same
- ▶ sort of placentitis is present, but the infection is not so exten
- ▶ sive
- ▶ in the trophoblasts covering the cotyledonary villi except
- ▶ at their base, or in the trophoblasts lining the caruncular
- ▶ crypts, although many of the syncytial trophoblastic cells may
- ▶ be necrotic.





- ▶ **The fetus is usually autolysed** and somewhat edematous
- ▶ with blood-tinged subcutaneous fluid. The same fluid is
- ▶ present in excess in the body cavities and the dorsal retroperitoneum.
- ▶ The normal abomasal content of a fetus is clear,
- ▶ translucent, thick, and viscid; in brucellosis, it often becomes
- ▶ very turbid, of a lemon-yellow color, and flaky. The important
- ▶ fetal lesion in brucellosis is pneumonia, which is present to some
- ▶ degree in most fetuses aborted in the last half of pregnancy. The
- ▶ lungs may appear grossly normal, but histologic examination
- ▶ reveals scattered microscopic foci of **bronchitis and bronchopneumonia.**
- ▶ When severely affected, the lungs are enlarged
- ▶ and shaped to the thoracic contour, firm on palpation, reddened
- ▶ on the pleural surface or hemorrhagic, and with **fin yellow-white strands of fibrin on the pleura.**

- ▶ **Microscopically**, there may be any stage from the minor
- ▶ changes mentioned through a well-developed catarrhal bronchopneumonia to the fibrinous variety. The predominant
- ▶ inflammatory cells are mononuclear, although many immature
- ▶ and mature neutrophils may be present in some areas. The
- ▶ septa may be edematous and with perivascular leukocytes.
- ▶ In bovine brucellosis, by the time the placentitis has advanced
- ▶ to an extent where abortion is inevitable, acute diffuse endometritis,
- ▶ without histologic specificity, has developed.



- ▶ **Brucellosis in sheep, caused by *Brucella ovis*.**
- ▶ A *Brucella* mutant, *B. ovis*, causes a specific form of epididymitis in rams
- ▶ in most parts of the world in which sheep are raised. The
- ▶ organism also causes placentitis in pregnant ewes, but epididymitis
- ▶ is the more common and important manifestation of the
- ▶ infection.
- ▶ There are probably as many modes of transmission as there
- ▶ are for the *Brucella* in general, but in this disease, the coital
- ▶ route is important; infected rams excrete large numbers of the
- ▶ organism in the semen

- ▶ **Brucellosis in dogs**, caused by *Brucella canis*. *B. canis* was first isolated and recognized as a cause of abortion and epididymitis in dogs

## Viral Infections of uterus and fetus

### Herpesviruses

- ▶ In domestic animals 5 different herpesviruses cause infertility, stillbirth, abortion or neonatal infections.
- ▶ Cattle, horses and pigs are the most affected animal species. While goats and dogs are less infected, sheep are affected by sporadic events.
- ▶ Herpes viruses remain latent in infected hosts that are free of primary disease. These factors are host specific except for Herpesvirus suis.

# Major fetal lesions in the infections

- ▶ Lymphoid necrosis
- ▶ **Multiple small necroses** in the parenchymal organs; mild acute inflammation,
- ▶ Eosinophilic **intranuclear inclusion bodies** (lung, liver, adrenes, etc.) are seen in parenchymal cells around the necrosis.
- ▶ Generally, necrosis foci in the liver are large enough to be visible (pinhead) and appear as focal white areas.
- ▶ As vascular lesions, only endothelial cells are swelling.
- ▶ In addition, transudate in the chest and abdominal cavity, edema under the skin is shaped.
- ▶ There are only specific lesions in the placenta.

- ▶ In 50% of the cases, multiple, focal, yellow-white necrosis foci scattered in the liver parenchyma are seen.
- ▶ The spleen is large, there are capsular bleeding. The lymphoid follicles are prominent on the cross-sectional area.
- ▶ Occasional hemorrhagic necrosis focuses can be found in the renal cortex.
- ▶ Generally, petechial and ecchymotic hemorrhages are observed in all sides of the carcass.
- ▶ **Microscopically**, focal necroses in the liver, spleen, lungs and other tissues (such as adrenals) and the parenchymal cells around them have a small number of eosinophilic intranuclear inclusion bodies.
- ▶ There are edema and hemorrhages in the lung, hyperplasia in the bronchiolar epithelium, necrosis, desquamation.
- ▶ Sometimes fibrinous bronchiolitis can be seen.
- ▶ There are no placental lesions.

## Parvovirus

- ▶ Cats lead to congenital cerebellar hypoplasia.
- ▶ The degree of this varies according to the age at which the fetus is infected.
- ▶ The virus has the ability to follow the cells leading to the mitosis (mitocidal virus). Therefore, the lesions are shaped depending on the developmental stage.
- ▶ Feline panleukopenia virus infects the rapidly dividing cells of the external granular layer of the cerebellum. These cells are still dividing cells towards the end of pregnancy and in the neonatal period.

## **Newborn Dog Puppies**

- ▶ Embryonic premature death
- ▶ Interstitial pneumonia
- ▶ Intranuclear inclusion bodies

## **Bovine parvovirus**

- ▶ Early cerebellar hypoplasia Death + abortus.
- ▶ However, cattle are not the major cause of abortion (10-100%).

## **Akabane virus and Cache Valley virus**

- ▶ These are Bunyaviruses and cause fetal infections and abortions in sheep and other ruminants.
- ▶ The effect of the virus on the developing fetal central nervous system is eliminated by the neurons in the ventral horns of hydranencephaly, microencephaly, cerebellar hypoplasie



## Blue Tongue:

- ▶ 50 days of pregnancy Embryonal death + abortion
- ▶ Lamb 50-80 days Necrotizing encephalopathy
- ▶ Cattle 70th day Death, resorption, abortus  
70-130.day fetal death, Hydranencephaly

- ▶ **Flaviviruslar**
- ▶ **Equine Viral Arteritis Abortus**
- ▶ **Pesti viruslar**

## Protozoal Infections

### **Toxoplasma gondii infection in sheep and goats (Toxoplasmosis)**

- Although *Toxoplasma gondii* infects many species of animals, it is a significant cause of abortion in pigs, especially with sheep and goats.
- Abortus is usually formed in animals transported to the end of the pregnancy and into the heavily contaminated areas by cat-eye (in the oocyst).
- The agent has a cat-sheep life cycle. Contamination of sheep with catfish and dishwashing feeds and sheep's fetal membranes are infected by cats.

- ▶ Infected sheep are not clinically ill.
- ▶ There are no macroscopically lesions in discarded fetuses.
- ▶ In the cotyledonous chorio-allantois edema and cotyledons, focal white foci of 1-2mm may be seen.
- ▶ **Microscopically**, lesions in cotyledons occur in many intrauterine infections.
- ▶ It's different from fire. There are hypertrophy and hyperplasia in the chorionic epithelium before necrosis and spillage, and rarely toxic groups of toxoplasm are seen in the chorionic epithelium.
- ▶ Foci of leukomalacia are found in the brain. They are considered to be nonspecific findings related to fetal anoxia due to placentitis.

## **Neospora caninum infection in dogs, cats, cattle and sheep**

- ▶ The protozoal agent similar to *N. caninum* in cattle often causes abortion.
- ▶ Abortions occur in 3-9 months of gestation and usually do not have a macroscopic lesion in the fetus.
- ▶ However, they may occasionally have a similar effect on teratogenic viruses.
- ▶ Microscopically there are multiple necrosis foci and gliosis in the brain.
- ▶ They are formed in regions close to the capillaries where the hyperplastic endothelium is located.

- ▶ Protozoal agents appear in groups within these focal foci or dispersed over larger areas. They are sometimes seen in nerve cells or endothelial cells.
- ▶ The lesions in the heart are subacute multifocal inflammation of the epicardium, myocardium and endocardium. Myofibrils and endothelial cells are found.
- ▶ Mononuclear portal hepatitis and multifocal hepatocellular necrosis frequently occur in sinusoidal fibrin thrombi.
- ▶ Focal, mononuclear inflammatory cells may also be found in other organs, including the placenta.

## Trichomonas foetus infection in cattle

- ▶ T. foetus infects the nonpregnant uterus as well as the pregnant.
- ▶ Infection is characterized by subclinical abundance in the bull's glans penis and preputium mucosa.
- ▶ In the bulls, initially purulent balanopostitis is formed, then the inflammation disappears, but there is a continuous factor in this region.
- ▶ In young calves, acute vaginitis is characterized by swelling of the vulva and vaginal discharge several days after mating with the infected bull.
- ▶ **Mucopurulent cervicitis ve endometritis**

## Sarkosistis infections

- ▶ Sarcocystis spp. causes abortion, stillbirth, neonatal death in cattle, goats, sheep and pigs.
- ▶ Unlike other protozoans, they are specific for host-species.
- ▶ Animals become infected with food and water contaminated with oocysts.
- ▶ Acute necrotic endometritis in the cow and the formation of multifocal necrosis in the soft tissues of the fetus.
- ▶ There is no explanation for the fact that the agent is sometimes seen in the mother, sometimes only in the offspring. In the cow, abortion followed by endometrium and caruncles.



- ▶ When the infection spreads to the fetus, there are foci of multifocal necrosis surrounded by indifferent mononuclear cells and lymphocytes in the brain and meninges.
- ▶ Similar lesions are also seen in the heart muscle, kidneys, liver, lung, chorioallantoic membranes.
- ▶ Some of these lesions become calcified and undergo fibrosis.
- ▶ Thin-walled and lumens overflowing cysts are seen in many soft tissue endothelial cells.
- ▶ Vascular thrombosis may occur.
- ▶ Cysts are also found in the brain, in the maternal caruncles and in the endometrium in areas away from inflammation.

## Abortions due to fungal infections (Mucotic abortions)

- ▶ Mucotic abortions are seen as sporadic cases rather than outbreaks in a herd.
- ▶ *Aspergillus* is the most common cause of mucotic abortion in cattle and horses. *Absidia*, *Mucor* and *Rhizopus* follow.
- ▶ In cattle, infection of the pregnant uterus is done by hematogenous route.
- ▶ It passes from the mother's respiratory or digestive tract to the placentom of the pregnant uterus.
- ▶ In infected cows with ulcers in the gastrointestinal tract, the same fungus also causes lesions in the placenta.
- ▶ In mares, mucotic placentitis begins in the placental star region. This region of the placenta is the region covering the inner bone of the cervix.
- ▶ For this reason, mare infections are considered as an infection of the ascites formed by the cervix and vagina.

- ▶ Mucotic abortion and stillbirths usually occur towards the end of pregnancy.
- ▶ It is characterized by marked lesions in the placenta and occasionally the fetus.
- ▶ Usually the placenta is not discarded.
- ▶ In advanced cases, the placenta is thickened as a skin in cows, and includes both cotyledons and cotyledons.
- ▶ The edges of the cotyledons are thickened, gray-skin color.
- ▶ These peripheral thickness inflammatory cells are formed by the adherence of necrotic, maternal caruncle tissue to the periphery of the cotyledons.
- ▶ It is seen within and around the necrotic tissue and especially in the necrotic, thrombosed blood vessels in this region.
- ▶ The factors are demonstrated by silver stain.

## FOETAL CONGENITAL MALFORMATIONS

- ▶ Fetal death and abortion are not formed in all infections of the fetus (viral, protozoan).
- ▶ Some viruses lead to inadequate organ development, which is not lethal to the embryo and fetus, capable of forming only congenital malformation.
- ▶ With some protozoans, plants and chemicals can also be teratogenic.

## Teratogenic Viruses

- ▶ Reoviridae Family Viruses

  - Blue tongue virus

- ▶ Viruses Related to Bunyaviridae Family

  - Akabane virus

  - Cache valley virus

- ▶ Flaviviridae Family Viruses

  - Bovine viral diarrhea - mucosal disease (BVD-MD)

  - Border disease

  - Viral Arteritis of Horses

  - Parvoviridae

- ▶ **Teratogenic Effective Protozoa**

  - Neospora Infection

## Teratogenic Plants and Medicines

- ▶ *Veratrum californicum* plant is eaten by pregnant sheep, on the 14th day of pregnancy, cyclopia and long-lasting pregnancies pituitary aplasia are formed.
- ▶ *Lupine spp.*
- ▶ In addition, malformations and articular deformities were observed in pups born from cats treated with griseofulvin during pregnancy.

## CERVIX, VAGINA AND VULVA

### Congenital Malformations

- ▶ Congenital malformations of the cervix and vagina are shaped by the dysgenesis of paramesonephric canals during embryonic development.
- ▶ Cervical anomalies are most frequently formed in cows and there is no complete fusion of a double channel of the Müller system.
- ▶ The most common anomaly is the cervix bifida and the Double Os uteri externa. In addition, cattle may have hypertrophy, hypoplasia, aplasia, duct dilatation. Sometimes diverticulum is formed.

## **Cervix Bifida**

- ▶ This anomaly is characterized by the presence of 2 separate and different cervical canals.
- ▶ This anomaly does not affect fertility, but it causes births.

## **Double Os Uteri Externa**

- ▶ This common anomaly in cows is shaped by the presence of small residues of the medial wall of the paramonephric canal in the external bone of the cervix.
- ▶ This persistent segment, seen as a dense fibromuscular band, divides the normal cervical bone into 2 openings.
- ▶ It has no effect on fertility, but it causes births.



## Tumefaction of the vulva

- ▶ In many mammalian species, the vulva swells physiologically in estrogen stimulation. This is the normal phenomenon seen in oestrus.
- ▶ However, this bulging and excessive continuity is abnormal.
- ▶ These changes occur in hyperestrogenesis.
- ▶ The most striking example is the poisoning of pigs with mucotoxin zearalenone in moldy corn.
- ▶ Zearalenone is usually affected by young animals.
- ▶ The elderly are more resilient.
- ▶ The vulva and the vagina are swollen, swollen.
- ▶ Sometimes the mucous membrane becomes prolapsed.

## Inflammation

- ▶ Inflammatory lesions of the cervix are usually absent.
- ▶ They are shaped as extensions of vaginitis and / or endometritis.
- ▶ There is also cervicitis in every endometritis. However, its severity is always less than endometritis.
- ▶ Such inflammations are superficial except for tuberculosis and necrobacillosis.
- ▶ In dogs, especially after ovariohysterectomy, purulent cervicitis is shaped.

## Vagina and Vulva Special Inflammation

### Granular Vulvovaginitis (Granular venereal disease, Vestibular lymphocytic follicles)

- ▶ All domestic animals have lymphocytic nodules in the subepithelial region of the vestibula.
- ▶ They are located in parallel longitudinal sequences in cattle, and are particularly common in the vicinity of the clitoris.
- ▶ The irritation of the vestibular mucosa with chemical or microbial agents causes hyperplasia and hyperemia in these nodules.
- ▶ This case is defined as granular venereal disease (nodular venereal disease) and is characterized by papular lesions in the vulva mucosa.

## Macroscopic findings

- ▶ In the acute form of the disease, pale or pink colored papules with a size of several mm, covered with mucosa are seen.
- ▶ When they are large numbers, they combine with each other, they form active, large, conjugate, red foci and are covered with a catarrhal exudate.
- ▶ At this stage, the upper epithelium is easily injured and the blood comes from the papules.
- ▶ Vulva is also edematous.
- ▶ As the disease becomes chronic, purulent exudate decreases, hyperemia and severity regress. Sometimes they can heal within 3 months or become acute again, and reinfection is also possible.

## Microscopic findings

- ▶ Each papular hyperplastic lymphoid follicles are seen.
- ▶ This area includes areas of congestion or haemorrhage. Mitotic activity is also detected in the germinal centers of these reactive follicles.
- ▶ In cows, white epithelial inclusion cysts with a diameter of 2-5 mm are observed in% 10% of the cases.
- ▶ Similar lesions are seen in the bulls' penis and prepuceium.
- ▶ The reason for the decrease of fertility in these animals is the fact that the vulvar lesions are transferred from the uterus to the uterus during mating.

## **Infectious Pustular Vulvovaginitis (Bovine herpesvirus-1 infection, Brachial venereal disease, Coital vesicular exanthema, IBR-IPV)**

- ▶ It is a contagious disease caused by Bovine Herpesvirus-1 in cattle.
- ▶ This virus is serologically different from the IBR virus, and although these 2 diseases are considered as separate, 2 syndromes may sometimes occur in the same herd or animal.
- ▶ Infection can also spread to sheep and goats and cause vaginitis.
- ▶ The infection is transmitted by coitus, artificial insemination or close contact.
- ▶ Incubation time is 1-3 days. Clinically, on the second day, the fever begins to rise and lasts for 3-7 days.
- ▶ These animals show frequent urination, swelling of the vulva, hyperemia of the vestibular mucosa, vulvar edema and a sticky exudate that hangs out like a rope.
- ▶ In some, white round, puffy areas of the vestibular mucosa are aching (0.5 mm) when touched.

## Macroscopic findings

- ▶ Initially, hyperemia and edema in the vagina and vulva are formed.
- ▶ Bleeding is observed in the lymphoid follicles in the vestibula after 2 hours of inoculation (2mm). After 24 hours, white areas of 0.5 mm in size are formed in the mucosa.
- ▶ On the second day, white pustules are formed and the entire mucosa is seen in bright red.
- ▶ The edges of the pustules are raised, the middle is flat.
- ▶ Pustules are formed on lymphoid follicles and are therefore seen as arrays.
- ▶ Then, ulcers covered with fibrinoid exudate are formed. They recover 8-11 days later.

## Microscopic Findings

- ▶ It is seen in the epithelial layer, lamina propria and lymphoid follicles.
- ▶ The epithelium contains bubble degeneration, intranuclear inclusion bodies, necrosis, neutrophil infiltration and desquamation.
- ▶ The inclusion bodies can be seen for 3-4 days. At the end of this period, the lesion loses its agent.
- ▶ In these lesions, vesicles and pustules are not formed.
- ▶ L.propria is hyperemic, edematous, there is an inflammatory infiltration, mostly composed of lymphocytes and plasma cells.
- ▶ The lymphoid nodular reaction is hyperplastic. It may be rapidly resected, but only epithelial thickening and hyperplastic lymphoid follicles are seen. Similar findings are found on the bulls' penis.



## Equine Coital Exanthema

- ▶ The disease is an acute viral disease caused by Equine herpesvirus-3 in equidae without significant disease findings.
- ▶ However, there are no signs of systemic disease. Heat, pulse, respiration, appetite remain normal.
- ▶ In the vestibula and vaginal mucosa, 1-25 mm red papules are formed.
- ▶ In experimental cases, the lesions are formed after 2 days in inoculations and 10 days after the infected stigma.
- ▶ These lesions are similar to infectious pustular vulvovaginitis lesions.

- ▶ Papules turn into pustular form and ulcers occur on day 6.
- ▶ There is an erythematous edge around the ulcers. These are morphologically similar in IBR to the lesions seen in the outer genitalia in mare and stallions.
- ▶ Pustules have a diameter of 2 cm and a depth of 0.5 cm.
- ▶ Ulcers are surrounded by a narrow erythematous border with 0.2.
- ▶ The lesions are found in the perineal skin and vulva mucosa.
- ▶ Intranuclear inclusion bodies are seen in the new necrosis area cells at the ulcer margin.
- ▶ In uncomplicated cases, there is an improvement within 14 days.
- ▶ Although the lesions are formed in pigmented skin, these regions remain as depigmented areas.
- ▶ Lips, external nostrils and nasal mucosa are also seen in the conjunctiva.

## Infectious Cervicovaginitis and Epididymitis of Cattle (Epivag)

- ▶ The disease is caused by herpesvirus in cattle (Herpesvirus-4, Cytomegalovirus).
- ▶ However, there are uncertainties about the etiology.
- ▶ The disease is transmitted by coitus. The incubation period is 1-2 days.
- ▶ The lesions are first formed in the anterior vagina.
- ▶ There is severe congestion and excess purulent exudate.
- ▶ Active infection lasts 2-3 weeks. Sometimes even 9 months can be found, and in these animals oestrus is normal
- ▶ From here it spreads to the uterus, oviduct and bursa ovarolar. 25% of infected females are sterile.
- ▶ In the bulls epididymis grows, the funiculus is affected by spermaticus. Following this, the testicular lesions are formed.

## Catarrhal vaginitis of cattle

- ▶ This disease, which is characterized by catarrhal inflammation of the vagina, is probably viral etiology.
- ▶ Although enterovirus has been isolated in some cases, it is not known exactly whether it is the actual factor or contamination because the disease cannot be established experimentally.

## ▶ **Dourine (mal de coit)**

- ▶ Dourine is a venereal disease caused by *Trypanosoma equiperdum*.
- ▶ The disease has been eradicated in Europe and North America, but is still seen as enzootic in Balkan countries, Africa, Asia and South America.
- ▶ Infection passes directly from one mammal to another (coitus) and is the only disease that does not require flies.
- ▶ Another feature of *Tequi-perdum* is that it is a tissue parasite, rarely found in the blood.
- ▶ The agent enters the vaginal mucosa and begins to proliferate locally in the lumen or wall before it becomes systemic.
- ▶ Trypanosomes are common in male and female genital currents and rarely in the blood.
- ▶ Infection is located in the skin and nervous system as well as in the genital system.

- ▶ First, it makes edematous swelling in the labia of the vulva. This finding is seen 8-14 days after mating with the infected stallion and there is a discharge of dirty mucous-pus from the vulva.
- ▶ The vulva-vaginal mucosa is usually swollen and irritated.
- ▶ Irritation of the vulvovaginal mucosa often leads to urination, and pain is present during this period (pain; squeezing the tail, opening and closing the vulvar lips, and being permanently hit with the foot).
- ▶ After passing the acute lesions, urticarial plaques are formed on the vulva and the surrounding skin in round or epileptic form. They are felt like disc under the skin.

- ▶ They're different sizes. They are usually dollar in size and are called **dollar plates**.
- ▶ These plaques are quickly formed and disappear after a few hours or a few days later.
- ▶ Depigmentation sites are formed on the skin and clitoris within a few weeks.
- ▶ Subsequent stages of the disease include anemia, paralysis of the hind limbs, irregular fever, and slimming and death.
- ▶ The course of the disease is different. It takes 1-2 years in mild cases, rarely in 4-5 years. In more severe, chronic cases lasts 1-2 months. Rarely can last 1 week.
- ▶ Although dourine is a lethal disease, infected animals can sometimes heal.
- ▶ In some parts of the world, horses carry *T. equiperdum* without any symptoms. Donkeys and mules tolerate infection more than horses.