Ovarian Cysts in the Guinea Pig (*Cavia porcellus*)

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KEYWORDS

• Ovarian cyst • Ovary • Rete ovarii • Guinea pig • Rodent • Leuprolide • Deslorelin • Ovariohysterectomy

KEY POINTS

- Most guinea pig sows develop ovarian cysts.
- Ovarian cysts in guinea pigs are frequently, but not always, derived from the rete ovarii. Other possible sources of ovarian cysts are periovarian structures; persistent, unluteinized tertiary follicles; neoplasia; and infection.
- Many clinical signs classically associated with ovarian cysts (including bilateral, nonpruritic alopecia of the flanks) are likely the result of excess sex steroid production by follicular cysts. Rete cysts are not thought to be steroidogenic.
- The most sensitive diagnostic test is abdominal ultrasonography, whereas the most specific is histopathologic analysis of the cysts. Hematology, serum biochemistry, serum hormone levels, radiography, and fluid cytology are neither sensitive nor specific.
- Ovariohysterectomy is the definitive treatment of all ovarian cysts. Ovariectomy without hysterectomy is not recommended, because ovarian cysts have been associated with several uterine diseases.
- Alternative therapies include hormone injections and percutaneous cyst drainage. Treatment with hormone injections may cause resolution of follicular cysts, but is not likely to affect other types of cysts. Cysts often refill with fluid shortly after drainage.

INTRODUCTION

Ovarian cysts are known to develop in many species, including mice, cats, sheep, cows, monkeys, and humans.[1–5] The condition has been reported in guinea pigs (*Cavia porcellus*) since at least the early twentieth century and may be known as ovarian cysts, cystic ovaries, or cystic ovarian disease.[6] In modern exotic companion mammal practice, it is common knowledge that ovarian cysts are a cause of bilateral, nonpruritic alopecia of the flanks in guinea pig sows. Cysts may be derived from

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several possible structures, and this origin may profoundly influence treatment recommendations. Ovarian cysts are mentioned in most veterinary texts that cover guinea pigs, but the subject is not usually discussed in depth. This article provides a thorough review of ovarian cysts in the guinea pig.

ANATOMY AND PHYSIOLOGY

Classification

Ovarian cysts are classified by their location of origin in relation to the ovary: periovarian (also called paraovarian or parovarian) or intraovarian.[7] They may also be categorized according to cause: physiologic, infectious, and neoplastic.[8] Most ovarian cysts in guinea pigs are physiologic and intraovarian, derived from the rete ovarii or ovarian follicles.

Rete Ovarii: Anatomy

The rete ovarii is a network of tubules and cords that arises from the mesonephros. It is homologous with the rete testis of male mammals. It is lined by variably ciliated cuboidal to columnar epithelial cells and rests on a basement membrane. The rete ovarii is a normal structure in adult female mammals, with substantial morphologic differences between species.[9,10] Tubules begin in the periovarian tissue, enter the ovary at the hilus, and spread to varying degrees throughout the ovary. The rete ovarii is divided into 3 sections[9,11]:

- Extraovarian rete (ER): the portion in the periovarian tissue; also known as the transverse ductules of the epoöphoron
- Intraovarian rete (IR): the portion within the ovary; also known as the primary sex cords, medullary cords, or ovigerous cords
- Connecting rete (CR): the segments connecting the IR and ER

The ER is generally regarded as a blind-ended structure, although evidence exists in some species for a small communication (ie, the tuboretial connection) with the infundibulum of the fallopian tube.[12] The ER begins as a single wide tubule, branching and becoming more convoluted as it approaches the ovary. Many of the branches of the ER end blindly, but some segments join adjacent to the ovary.[11]

The adjoined ER branches become the compact cell cords of the CR, and are associated with the smooth muscles in the ovarian ligament. The cords pass through the ovarian hilus and into the medulla to become the IR.[13,14]

The extensiveness of the IR depends on the age and species of the individual; in some it may be absent, whereas in others it may branch heavily and even communicate with the ovarian cortex.[9,10,15] The cavian (ie, guinea pig) IR is most developed before birth (at approximately 49 days' gestation), and is largely situated in the hilus and medulla.[16,17] Most of the medullary IR has degenerated by parturition, with only the hilar portion remaining.[16] In contrast, the murine (ie, mouse) IR is extensive, branching throughout the ovarian medulla and into the cortex (**Fig. 1**).[9,18,19]

Rete Ovarii: Physiology

The function of the rete ovarii has not been clearly defined. In adults it is generally regarded as a nonfunctional embryonic remnant.[20] As such, it is not covered by some anatomy/reproductive biology texts.[21,22] The rete ovarii may have a role in folliculogenesis in some species.[9] Serial examinations of neonatal mouse ovaries reveal an extensive IR that extends into the cortex and contains many oocytes (see **Fig. 1**). Over the course of the first 2 weeks of life, murine granulosa cells