



# Diagnostic Exercise

From The Davis-Thompson Foundation\*



Case #: 97 Month: May Year: 2018

## Answer Sheet

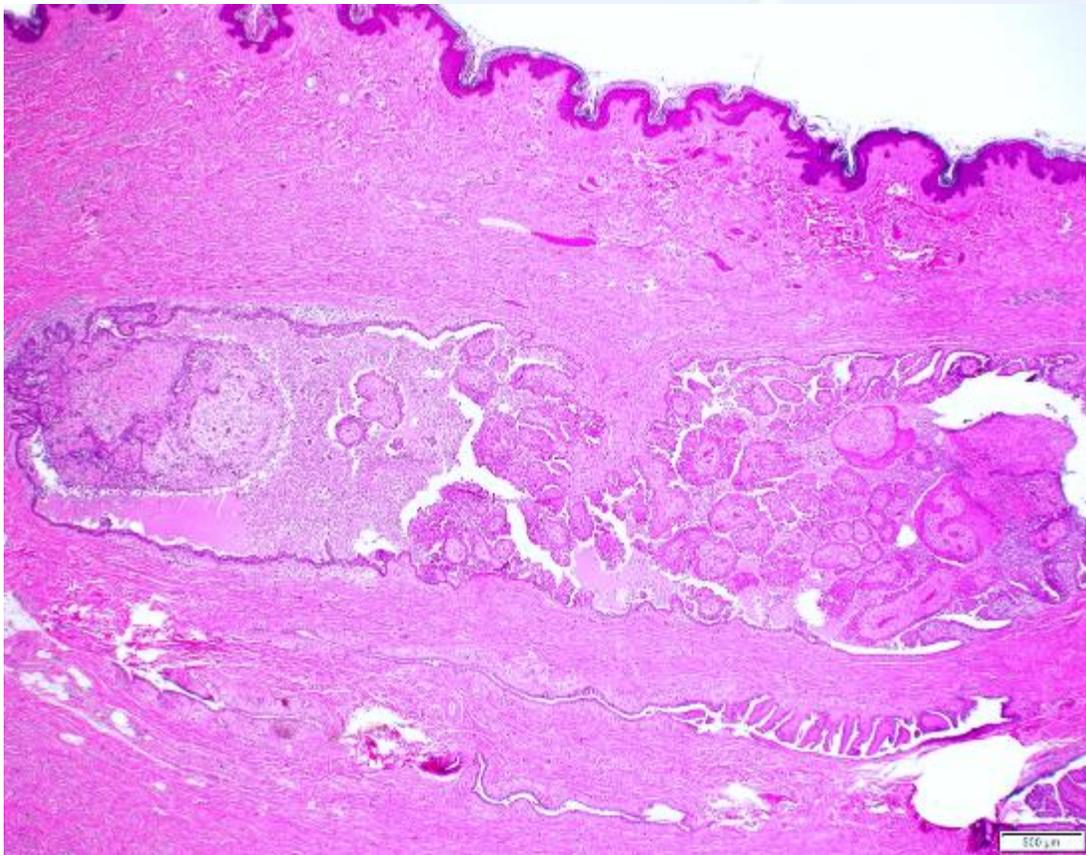
**Title:** Mammary papilloma, male rhesus macaque

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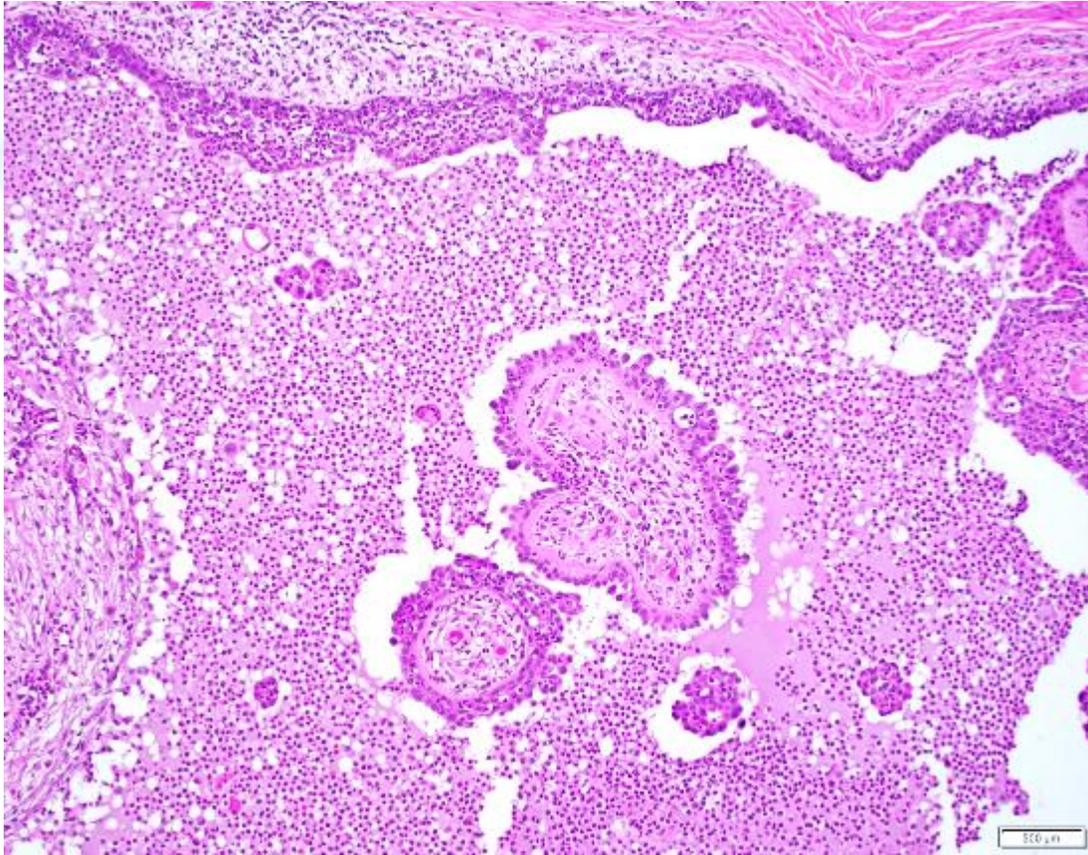
**Clinical History:** This 13-year-old male rhesus macaque was euthanized because it had reached the end of its research life due to old age. This lesion is an incidental finding.

**Necropsy Findings:** There were no gross lesions on necropsy.

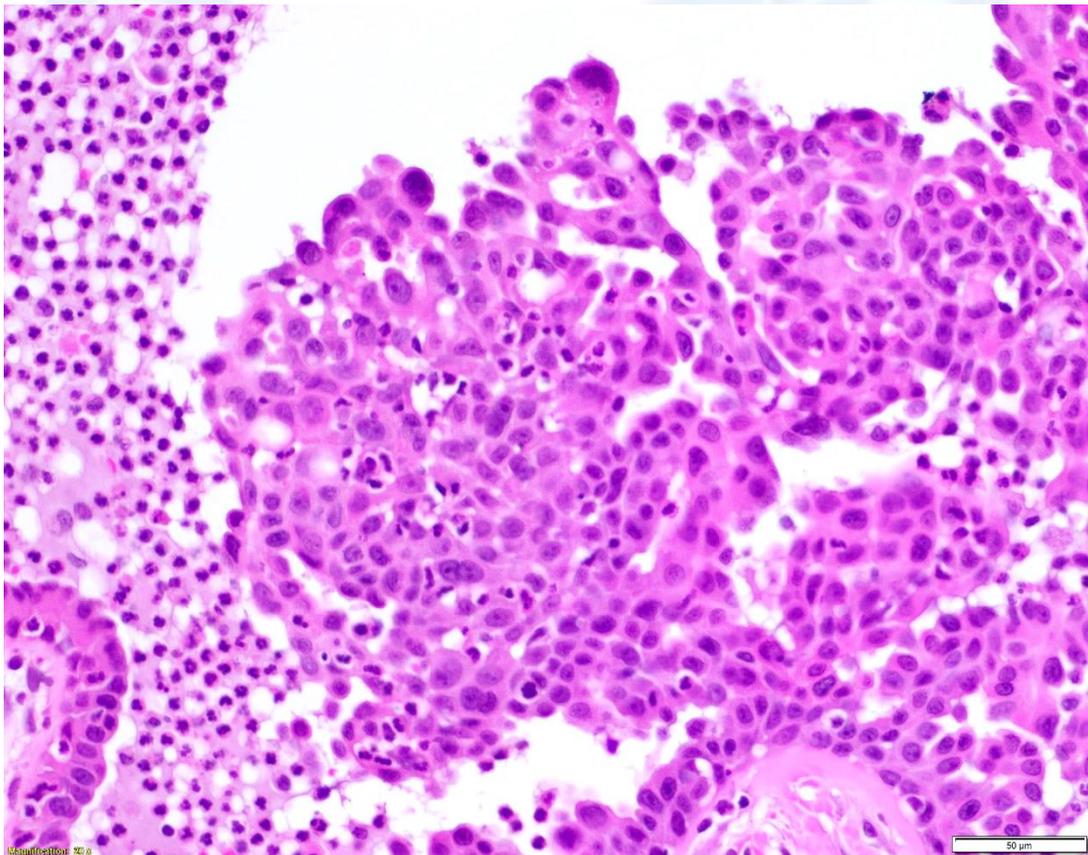
**Microscopic Images:**



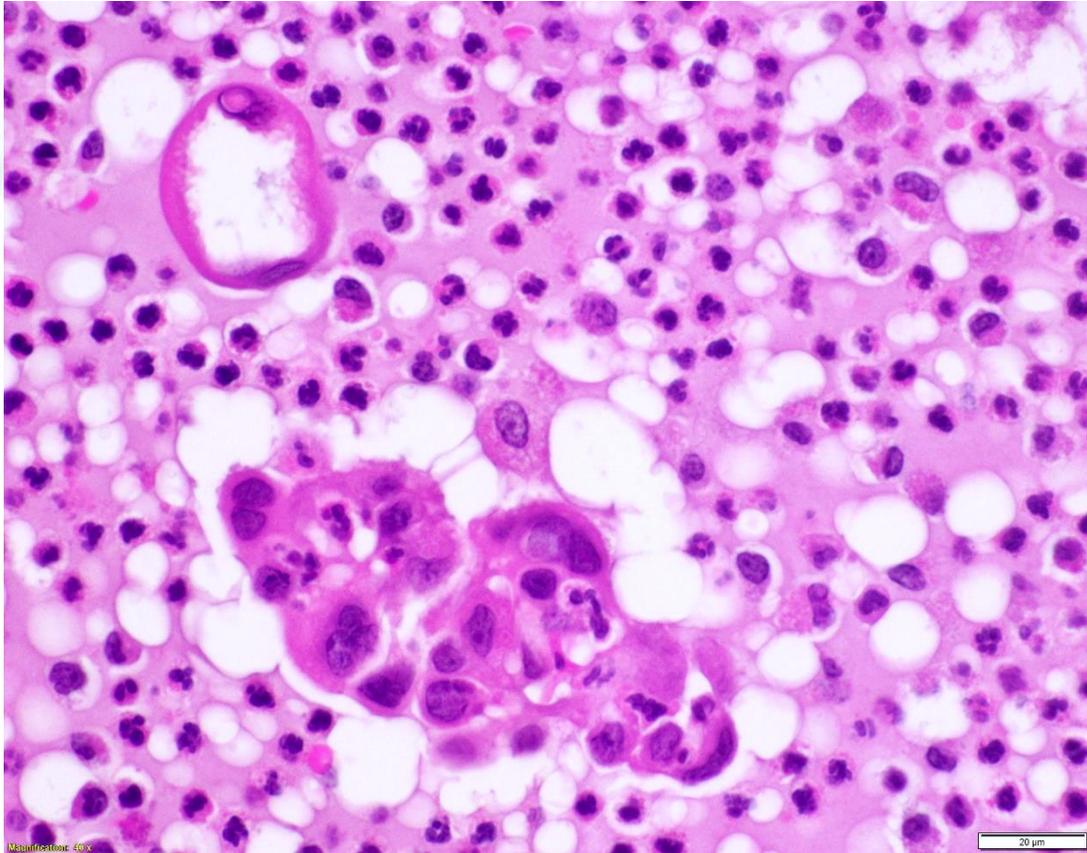
**Figure 1.** Mammary gland (teat duct). 20X, H&E stain.



**Figure 2.** Mammary gland (teat duct). 100X, H&E stain.



**Figure 3.** Mammary gland (teat duct). 200X, H&E stain.



**Figure 4.** Mammary gland (teat duct). 400X, H&E stain.

**Histologic Description:** Mammary teat: Projecting three-quarters into the duct lumen and markedly expanding the lumen is an exophytic papillomatous proliferation that is contiguous with the surrounding connective tissue. The stalk is composed of mature collagen that contains few collapsed and atrophic glandular epithelial cells and scant vascularization. The glandular epithelium lining the papilloma is hyperplastic and up to four cells thick with moderate anisocytosis and anisokaryosis. Few mitotic figures are observed. Mixed with the longitudinally sectioned papilloma are numerous cross sections of papillomas that, in addition to a collagenous stalk, also have a myxomatous (presumed myoepithelial) matrix and larger centralized congested blood vessels. There are abundant viable and degenerate neutrophils adhered to the epithelium, free within the lumen, within the stalks of the papillomas, and also transmigrating the glandular epithelium, mixed with foamy macrophages and lesser lymphocytes and plasma cells, and eosinophilic flocculent proteinaceous fluid. The less affected glandular teat epithelium is also hyperplastic, with small isolated islands of dysplastic epithelium within the duct.

**Microscopic Morphologic Diagnosis (based on the pictures shown):**

Mammary teat, duct: Nipple duct papilloma; Mastitis, neutrophilic, focally extensive, marked.

**Possible Cause/s:** Inflammation and irritation leads to the formation of hyperplastic epithelium and duct papillomas. Theories supporting tumorigenic effects of mammary neoplasms include androgens, growth hormones, irradiation, aging, and immune status.<sup>1</sup>

**Comments:** This case garnered internal discussion amongst our pathologists as to whether this was a benign versus in-situ carcinomatous process. Referral to medical counterparts, who are well versed in human mammary histology, rendered the final diagnosis. Lab animal veterinarians will observe primates playing with their nipples, so this may be the instigator of the inflammation, or a sign that inflammation is

present. There are only three published cases of in-situ duct carcinomas in male non-human primates and only one is reported in a rhesus macaque, so mammary neoplasia in males is exceedingly rare.<sup>2</sup> Neoplastic lesions were described as palpable masses within the nipple. Hyperplastic lesions reportedly occur along ducts and include features such as columnar cell alteration, micropapillary hyperplasia with atypia, and fibroadenomatous change. In-situ carcinomas have solid, comedo, cribriform, and micropapillary elements. Invasive ductal carcinomas are generally solid, with prominent central necrosis and mineralization, often on a background of micropapillary ductal hyperplasia and in-situ carcinoma. Histologic changes of invasive lesions include increased mitoses, nuclear pleomorphism, extensive microinvasion, and stromal desmoplasia.<sup>3</sup>

#### References:

1. Cohen M, Saidla JE, Schlafer DH. A spontaneously occurring mammary gland ductal carcinoma (in situ) in a rhesus macaque (*Macaca mulatta*) and a review of spontaneous mammary tumors in rhesus monkeys. *J Med Primatol* 30:121-126, 2001.
2. Roberts BM, Chumpolkulwong K, Tayamun S, Inamnuay L, Rungsipipat A, et al. Mammary carcinoma in a male rhesus macaque (*Macaca mulatta*): Histopathology and immunohistochemistry of ductal carcinoma in situ. *J Med Primatol* 43:213-216, 2014.
3. Wood CE, Osborne AL, Starost MF, Tarara RP, Hill LR, et al. Hyperplastic and neoplastic lesions of the mammary gland in macaques. *Vet Pathol* 43:471-483, 2006.

\*The Diagnostic Exercises are an initiative of the **Latin Comparative Pathology Group (LCPG)**, the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website ([http://www.cldavis.org/diagnostic\\_exercises.html](http://www.cldavis.org/diagnostic_exercises.html)).

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