SPONTANEOUS NEOPLASIA IN RHINOCEROTIDAE: COMBINED RETROSPECTIVE CASE SERIES AND LITERATURE REVIEW.

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Introduction

The family Rhinocerotidae includes five near-threatened to critically-endangered rhino species (IUCN Red List). Scientific literature around rhino neoplasia is sporadic and unreviewed.

Materials and Methods

Fifty-nine neoplasms from 49 rhinos were reviewed from IZVG Pathology (n=7 individuals) and current scientific literature (18 peer-reviewed publications, using Google Scholar/PubMed keywords: “rhinoceros”, “tumor”, and “neoplasia”). Species included greater one-horned (n=27), southern white (n=15), southern black (n=4), Sumatran rhinoceros (n=2) and non-specified (n=1).

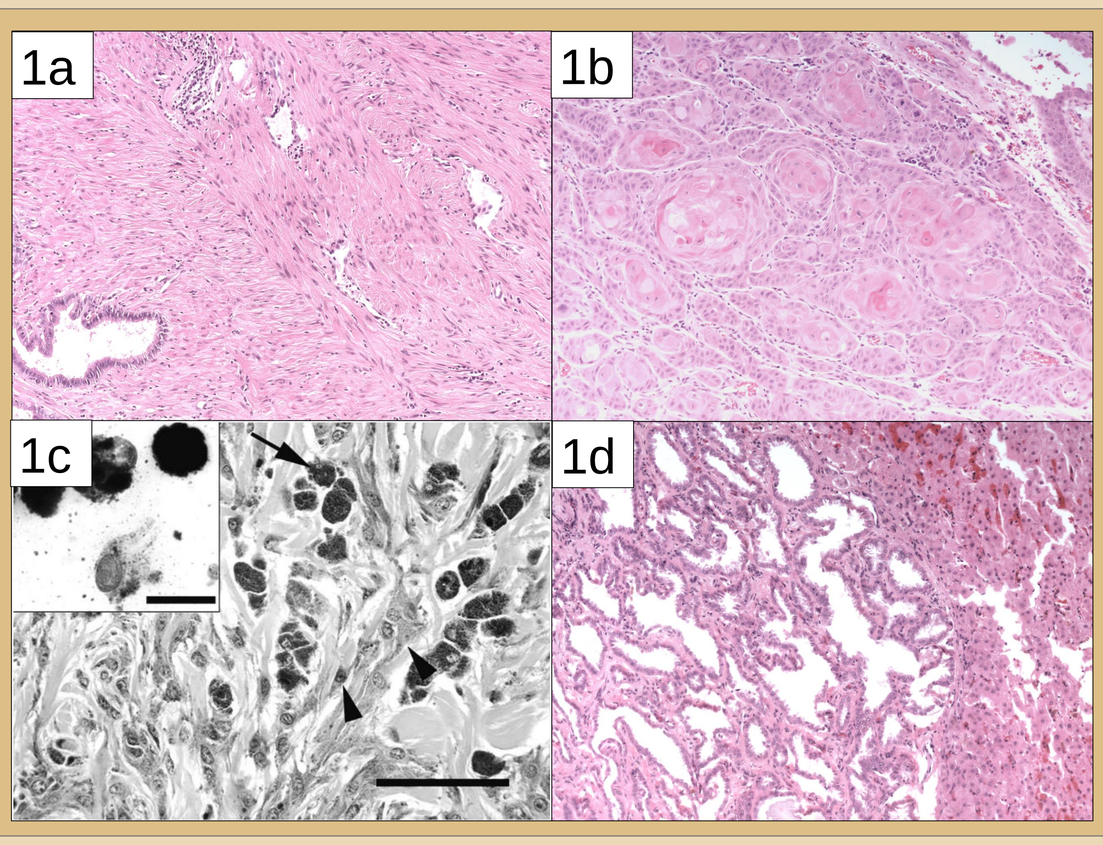
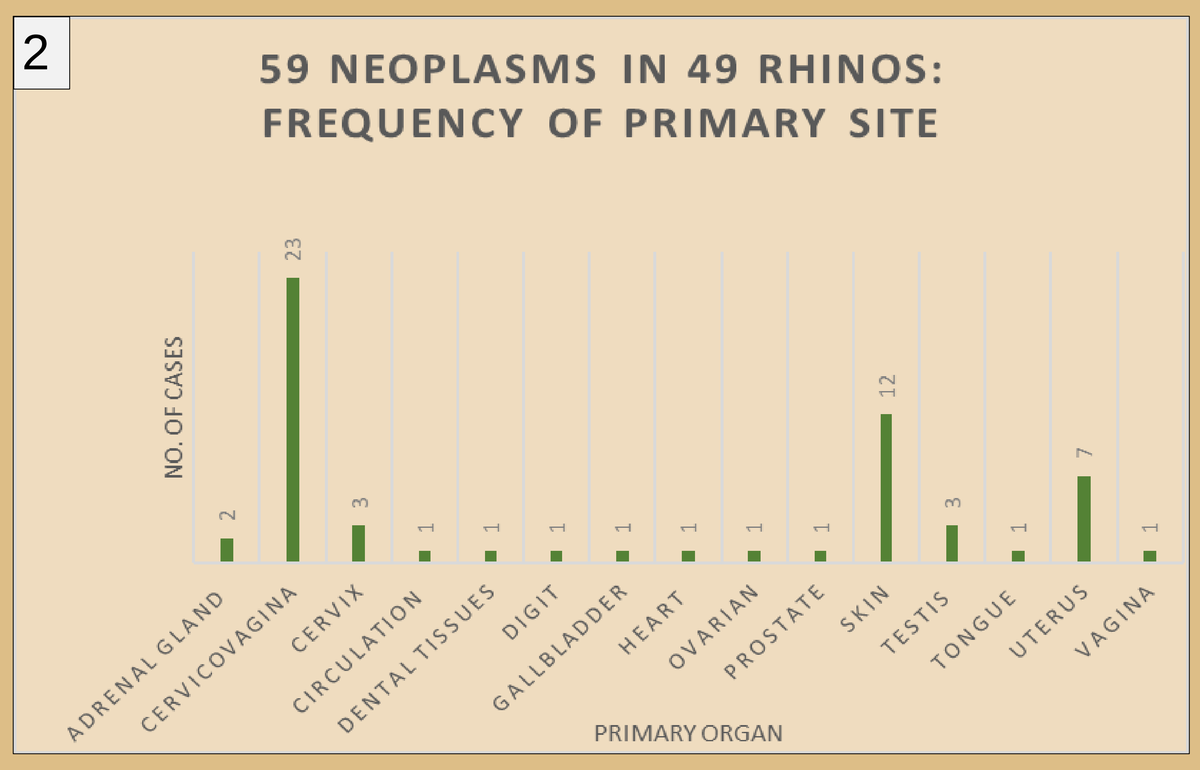
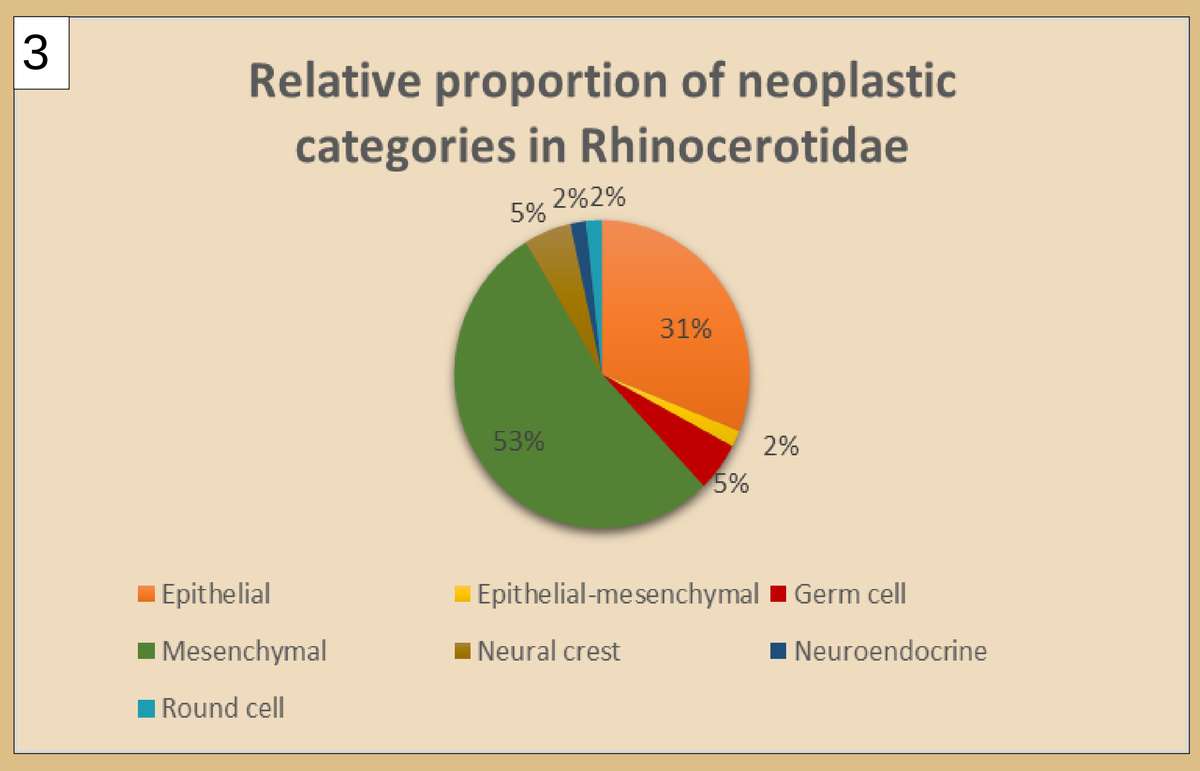


Fig. 1: Histopathology of rhino neoplasia.1a) Uterine leiomyoma in a greater one-horned rhino. 1b) Cutaneous squamous cell carcinoma in a southern white rhino (HE, 100x).1c) Cutaneous melanocytic neoplasm in a southern black rhino (HE, bar = 40µm), insert: cytology - clustered melanised epithelioid cells (MWG, bar = 130µm). 1d) Biliary cystadenoma in a southern white rhino (HE, 100x).





Species differences

- **By species, the commonest tumours were:**
  - Greater one-horned: Non-ovarian reproductive tract [NORT] leiomyoma (79.3%).
  - Southern white: Squamous cell carcinoma [SCC] (35%).
  - Southern black: melanocytic tumours (2/4).
  - Sumatran: NORT leiomyoma (2/3).
  - ➢ *See figure 1 for histopathology examples*.
- **Southern black rhinos**
  - Younger (average 8.4 years).
  - Mostly male with malignant tumours: acute lymphoblastic leukaemia, cutaneous malignant melanoma and malignant seminoma.
- **Greater one-horned rhinos**
  - Average 22.9 years old.
  - Mostly females with NORT leiomyomas (87%).
- **Sumatran rhinos**
  - Mostly females with NORT leiomyomas (2/3 tumours).
- **Southern white rhinos**
  - Average 39 years and 50:50 sex ratio.
  - 70% malignant tumours:
    - 10% metastatic rate.
    - Eight SCCs, 2 malignant seminomas, and single cases of ovarian adenocarcinoma, prostatic carcinosarcoma, adrenocortical carcinoma and cutaneous soft tissue sarcoma.

General neoplasia statistics

- **Frequency of benign vs malignant tumours:** 55.9 vs 42.4% respectively.
- **Neoplasia associated-death or risk to life (without treatment)**: 20.3%
- **Overall rate of metastasis**:
  - 6.8% of all tumours.
  - No organ predisposition.
- **Most common tumours:**
  - Female NORT tumours (57.6%; comprising 45.5% benign and 12.1% malignant)
  - Cutaneous squamous cell carcinomas (13.6%):
    - Out of 9 SCCs, 8 affected southern white rhinos.

Conclusion

NORT leiomyomas and SCCs are most common in greater one-horned and southern white rhinos, respectively. Metastatic neoplasia appears rare.

Image reference: Wack AN et al. Melanocytic neoplasms in a black rhinoceros (*Diceros bicornis*) and an Indian rhinoceros (*Rhinoceros unicornis*). Journal of Zoo and Wildlife Medicine. 2010 Jan;41(1):95-103.