

Feline Urinary Obstruction Data Analysis

February 21, 2024

I. Introduction

This report presents the results of an Exploratory Data Analysis (EDA) conducted on a dataset related to feline urinary obstruction (UO). The objective is to identify patterns and relationships in the data that can help answer key research questions concerning factors influencing UO procedure difficulty, recurrence, and post-treatment outcomes.

The dataset comprises 105 observations and 93 variables, including numerical and categorical attributes related to patient demographics, medical history, treatment procedures, and clinical outcomes. The primary goal of this analysis is to extract insights that can inform veterinary decision-making and improve patient care.

We are looking at a few variables to observe their relation to repeat Urinary Obstructions in cats. These variables are: `Weight`, `Age`, `History`, and `Difficulty`.

II. Research Questions and Findings

Were overweight patients more likely to have another urinary obstruction than their healthy-weight counterparts?

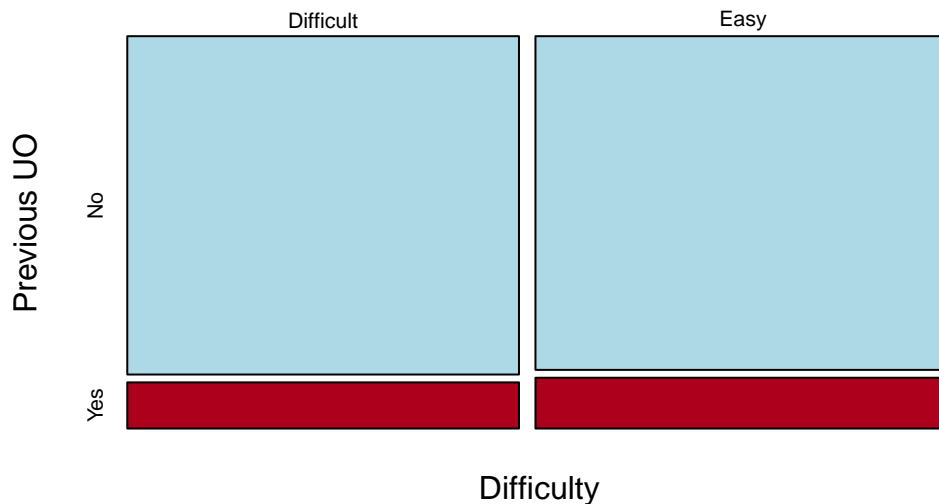
We found that there overweight cats were not more likely to have a repeat UO. We separated the data into two weight classes under the variable name `weight_class`. The 3rd quartile of weights of patients in the dataset was 15.4 lbs, so we grouped cats who were over that threshold as `Heavy` and those under the threshold as `Not Heavy`. The proportion of cats who had a repeat UO and cats who didn't in both groups was roughly the same, pointing towards no correlation.

Weight Class	Repeat UO	Number of Cases
Heavy	No	20
Heavy	Yes	2
Not Heavy	No	58
Not Heavy	Yes	7

Were patients with histories of urinary obstruction more likely to have a difficult procedure?

We found no connection between cats with previous instances of urinary obstruction and having a greater chance of having a difficult procedure. The number of cats who had a difficult procedure and those who had an easy one were nearly the same. Among the two groups the proportion of cats who had a history of UO was very similar. 12.6% of the cats had history, and around 46% of those cats had a difficult procedure.

Procedure difficulty by previous urinary obstruction



Were patients that experienced difficult procedures more likely to have another urinary obstruction?

Patients that experienced difficult procedures were not more likely to have another urinary obstruction. The proportion of cats who had repeat urinary obstruction as opposed to cats who did not have one was extremely similar in both difficulty groups.

Repeat	Difficulty	Median Age	Mean Age	Number of Cases
No	Difficult	4.665	5.666053	38
No	Easy	4.640	4.880250	40
Yes	Difficult	8.200	7.575000	4
Yes	Easy	10.000	8.616000	5

However, we did observe a relationship between a cat's age and having repeat urinary obstruction regardless of the procedure difficulty. Both the median and mean age of cats who didn't have a repeat UO was lower than cats who did have a repeat, regardless of the difficulty group they were in. Other analysis methods (like a simple logistic regression) reinforce this relationship. In a simple model we created to predict the probability of a cat having a repeat OU, where age was the only variable taken into account, age had a significant effect on the odds of having a repeat OU. For every additional year a cat lives, it's odds of having a repeat urinary obstruction increase by around 29%.

Age v. procedure difficulty by repeat UO

