INTRODUCTION

Anthropologic history provides evidence that urinary calculi existed as long as 7000 years ago and perhaps longer. The speciality of urologic surgery was even recognized by Hippocrates, who in his famous oath for the physician stated "I will not cut even for the stone but leave such procedure to the practitioner of the craft" (Clendening, 1942). The recognition of different varieties of urinary calculi also resulted in more varieties of medical treatment most of which failed. Now however, may be major advances have greatly improved our understanding of the causes of stone diseases. Procedural therapy continues to be important as an aspect of management of urinary calculi but it is only one step in the total plan for patients with urinary lithiasis.

Urolith formation is not a specific disease but the sequela to a group of many disorders. The urinary system is designed to dispose of wastes in liquid form. However, during urolith formation, sustained alternations in urine composition promote oversaturation of one or more substances eliminated in urine and resulted in their precipitation and subsequent growth. The fact that urolith formation is erratic and unpredictable emphasizes that several inter related pathologic and physiologic factors are often involved i.e. evil urine (nephritis, pyurea and acidic pH of urine). Imbalance of calculi preventing substances within the body, therefore detection of urolithiasis is only the beginning of the diagnostic process. Essential to urolith eradication and prevention is identification of disease and risk factors underlying crystal formation, retention and growth of calculi.

There are three theories with regards to the physiological process of how calcium oxalate stone formation occurs.

i) Precipitation-crystalization theory

ii) Matrix nucleation theory

iii) Crystalization inhibition theory

The precipitation crystallization theory implies that, the bladder's urine is super saturated with stone forming crystalloid, calcium, oxalate and urea. Which results in calcium oxalate uroliths. This theory is supported by
hyperparathyroidism, excess vitamin D in the diet and decreased calcitonin secretion by the thyroid gland, defective tubular reabsorption of calcium and pseudohyperparathyroidism.

The matrix nucleation theory implies that there is organic material present that is the nucleus for crystalloid material forming. This nucleation encourages the continued growth of the crystalloid material resulting in stone formation. This could be due to increased renal excretion with glomerular filtration, decreased tubular reabsorption, or increased tubular secretion e.g. acidosis, hypercalciurea and hyperoxaluria.

The crystallization inhibition theory implies that there is a reduction of crystalloids inhibitors have been experimentally tested in the human and dog i.e. cellulose phosphorus, inorganic phosphorus, magnesium oxide, pyridoxine, alanine and pyruvate. Once the stone formation has occurred in urinary tract, there is every likelihood of it causing obstruction in the urinary tract. Finco et al. (1970) reported that urolithiasis in dog was less frequently found in kidney. The obstructive lithiasis can be life threatening condition, it is therefore important for clinician to investigate pathogenesis/diagnosis and treatment of the conditions as early as possible.

The cases of canine urolithiasis have been treated with variable rate of success. Major problems associated with the surgical removal of calculi includes post-operative uremia and difficulty in removing the calculi when it is lodged in ureter. Conservative management may be the choice of treatment in the cases of non-obstructive and partial urolithiasis and to prevent the recurrence of urolithiasis after surgery. Renal calculi analysis has been extensively studied and calcium oxalate urinary calculi were found to be predominant (Domingo et al., 2001; Case et al., 1993; Bovee and McGuire, 1984).

Calcium is a threshold substance and the serum calcium levels are regulated by parathyroid hypercalciuria and hyperparathyroidism appears to be interrelated disease but do not appear to be taken into consideration while evaluating the causes of urolithiasis. Review of literature reveals that no systemic research appear to have been undertaken to study a relationship between parathyroid activity and urolithiasis. Therefore it is contemplated to study partial and complete urethral obstruction with special reference of parathormone in canine with following objectives.
Objectives:

1. To investigate the pathogenesis/process of calculi formation in urine reservoir.

2. To study various methods used to reach the diagnosis and to confirm the diagnosis of canine urethral obstruction.

3. To ascertain the role of parathormone in the formation of urinary calculi in canines.

4. To delineate a proper post-operative care of the animals in which surgically urine flow is established.

5. To establish a relationship between urinary calculi and composition of water given to the patients under study.