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Clinical Article

TESTICULAR MICROLITHIASIS IN A BUFFALO BULL- A RARE CASE

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SUMMARY

This random study was conducted on three young non-breeding Murrah buffalo bulls aged between 4-5 years maintained for teaching purposes in the experimental yard.The real time two dimensional B-mode trans-cutaneous ultrasonography equipped with transducer having frequency between 3.0 to 5.0 MHz was carried out for assessing testicular health simply before auction without any specific reason. Out of three buffalo bulls, one bull showed microlithiasis. As calcification is seen in tuberculosis, therefore, the animals were subjected to intra-dermal tuberculin testing and radiological examination and were confirmed negative for tuberculosis. The present case is remarkable in that there is a paucity of reports on spontaneous testicular microlithiasis in bulls.

Key words: Buffalo, bulls, microlithiasis, Murrah, testicular, ultrasonography.

Testicular microlithiasis (TM) is characterized by micro-calcification in the testis. This condition needs to be differentiated from early stages of tuberculosis and tumors of testicular cells. This condition has been reported in human beings; however, this has not been reported in large animals so far. Crew and Fell (1922) reported "ovum like bodies" in the seminiferous tubules in the ectopic testis of a goat, cat and rabbit. They stated that these bodies proved to be not ovarian but the degeneration products of the germinal epithelium of the seminiferous tubules. These bodies appear to be produced by the gradual liquefaction of masses of desquamated cells, whereby large colloid globules are formed which subsequently undergo calcification. Testicular microliths have been described as intra-tubular bodies containing a calcified center with concentric laminations of collagen fibres. They are theorized to arise from defective phagocytosis of degenerated tubular cells by Sertoli cells (Vegni-Talluri *et al.,* 1980). Microliths have been reported in retained testes of several species, including the goat, cat, rabbit, and horse (McKentee, 1990). Recently, Shirai and Evans (2018) in monkey reported that the cells that encircled testicular microliths were Sertoli cells.

Diagnostic methods for assessing the health of the bull's testis and related structures mainly include manual palpation, measurement of scrotal circumference, testicular diameter and evaluation of semen. Other methods like thermography, tonometry and biopsy could not prove their worth in veterinary medicine. Diagnostic ultrasound seems to be the best technique for the evaluation of scrotal contents and is ideally suited for this type of examination because of their general superficial location. It is very useful in diagnosing the presence or absence of a mass, as the homogeneous echo pattern of the normal testis serves as a good background for the detection of small intra-testicular focal lesions; the size of which can also be measured accurately. In many cases, it can give a specific diagnosis. With the help of ultrasonography, cases of testicular tuberculosis and Sertoli cell tumors have been reported at our university and several other reports are also available in the literature (Singh *et al.,* 2015). With this technique, it is also possible to differentiate between solid and cystic enlargements. An ultrasound scan can be used safely to diagnose the presence of any kind of abnormality. It may also be used as a guide for a definitive biopsy or surgical exploration (Ali *et al.,* 2011). The study was conducted on three young non-breedingMurrah buffalo bulls aged between 4-5 years, maintained for teaching purposes in the experimental yard, Department of Veterinary Surgery and Radiology, LUVAS. These bulls were randomly evaluated for testicular health using real time B-mode trans-cutaneous ultrasonography equipped with transducer having frequency between 3.0 to 5.0 MHz. 5. 6.

The animals selected for this study were housed in half walled pucca sheds with asbestos sheet roof and were stall-fed with adequate quantity of green fodder and wheat-bhoosa. Concentrate feed, supplemented with mineral mixture and common salt, was also provided. Drinking water was provided *ad. libitum* and the animals were well protected from inclement weather.

Out of all the three healthy bulls showing no external sign of scrotal/testicular abnormality, one bull showed testicular microlithiasis in both the testis (5 and 7 respectively, in numbers). The size of the microliths was <3 mm and neither tissue reaction nor luminal tubular dilatation was seen in areas of these microliths (Fig. 1-4). Microliths were not present in vascular areas of the testis and in the epididymis.All the animals were confirmed negative for tuberculosis by intra-dermal tuberculin testing and X-ray examination.Furthermore, these microliths were not evident in X-ray study. Due to paucity of literature and lack of ultrasonographic studies on testicular microlithiasis in large animals the findings of present study could not be compared.

Testicular microlithiasis is rare in occurrence. However, it has come to be encountered more frequently due to the increased number of situations in which high resolution ultrasound is used in the inguino-scrotal region to investigate testicular size in cryptorchidism or patency of the peritoneal-vaginal duct in human beings. TM is associated with hypogonadism, testicular neoplasia, cryptorchidism, subfertility, or other conditions (Derogee *et al.,* 2001; Hoei-Hansen *et al.,* 2005; Lofrano-Porto *et al.,*

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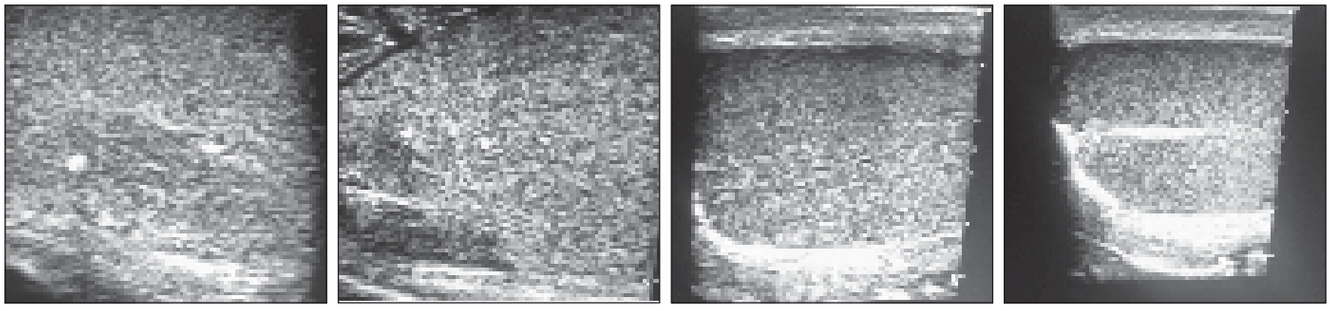

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2007) but has also been reported as an incidental finding in a healthy human patient (Priebe *et al.,* 1970). In human beings, there are evidences that TM is a precursor of testicular germ cell tumors (Höbarth *et al.,* 1992; Backus *et al.,* 1994) and that it is associated with infertility(Ganem *et al*., 1999). However, in present study, it remained unknown whether these were true cause and effect relationships or just incidental findings. Testicular microlithiasis typically occurs bilaterally but can be unilateral (Parra *et al.,* 1996) and the distribution of the calcifications can be diffuse or focal.

High-resolution inguino-scrotal ultrasound is a sensitive diagnostic tool, especially when high frequency linear transducers are used. It has come to be more widely used in recent years due to improvements in the quality of ultrasound equipment. Those that cast an acoustic shadow are therefore not considered characteristic of TM (Bushby *et al.,* 2002; Miller *et al.,* 2007) which is defined as five or more randomly distributed hyperechogenic microliths measuring less than 3 mm in diameter and seen in a single ultrasound scan. On the basis of findings of the current study, it can be concluded that diagnostic ultrasonography is a useful technique for diagnosis of testicular lesions in combination with other methods such as manual palpation, measurement of scrotal circumference and evaluation of semen. Since no such condition has been reported in cattle/buffalo bull in the literature but similar reports are found for goat, cat, rabbit, monkey and human testis; this is the first report revealing testicular microlithiasis in buffalo bulls. However, the seminal and fertility parameters in microlithiasis affected bulls need to be studied. Conclusively, the technique of testicular ultrasonography may be included in breeding soundness examination of breeding bulls.

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