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رئيس القسم : أ . د . / عبد الرحمن خاطر .

دراسة هستواثولوجية لكلية أجنة الجاموس المصاب بتمدد حوصلى فى  
الحبل السرى

صلاح ديب ، عقيل سلامه

تناولت هذه الدراسة عدد ٩ من أجنة الجاموس يتراوح أطوالها ٨ - ٤٢ سم والتي تعانى من وجود تمدد حوصلى فى الحبل السرى . ركزت الدراسة على الكلية ، التى أتضح بعد الفحص الميكروسكوى لها وجود اصابات فى القنوات البولية والأنابيب الشعرية الملتفة خصوصا عند منطقه الأتصال ما بين القشرة والنخاع ، هذا مع وجود تجويفات ميكروسكوبية مختلفة الأحجام وتكسر للخلايا الطلائية المبطننة للقنوات المتعرجة ، هذه الأخيرة عانت أيضا من التمدد ، فى المنطقة الداخلية للقشرة . دعت الدراسة الى الأهتمام بهذه الحالات لما قد يكون لها من تأثير ضار على الأجنة كعوامل مهيئة للعدوى بعد الولادة ، كما قد تؤثر على معدل نمو الحيوان ، أو تأشيرها فى أحداث خلل فى اتزان الأملاح داخل الجسم .

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## HISTOPATHOLOGICAL STUDY OF THE KIDNEYS OF BUFFALO-FOETUSES WITH CYSTIC DILATATION OF THE UMBILICAL CORD (With Two Figures)

By

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### SUMMARY

The kidneys of 9 buffalo foetuses (crown-rump length from 8 to 42 cm) with cystic dilatation of the umbilical cord were subjected to histopathological study. The lesions consisted of destruction of the renal tubules and glomeruli at the cortico-medullary junction with the development of cavities of microscopical size, and dilatation and epithelial destruction of the convoluted tubules at the inner cortical zone. The significance of these lesions in prenatal and postnatal life is discussed.

### INTRODUCTION

In an earlier study DEEB and SALAMA (1979) recorded oedema and segmental cystic dilatation of the umbilical cord in 15.3% of the pathological conditions found in 59 buffalo foetuses. Similar diverticular dilatation of the umbilical cord has been demonstrated in aborted foetuses of cattle and was suggested to be related to stagnation of urine in the urachus due to constriction, snaring or strangulation of the umbilical cord (STANG & WIRTH, 1932). In the present study, an attempt was made to investigate, histopathologically, the effect of this lesion on the structure of the kidneys during prenatal life.

### MATERIALS AND METHODS

The materials consisted of tissue samples from the kidneys of 9 buffalo-foetuses with a crown-rump (CR) length ranging from 8 to 42 cm. The umbilical cord of these foetuses showed circumscribed cystic dilatation. The samples were fixed in 10% formalin solution, dehydrated, cleared and embedded in paraffin wax. Sections 6  $\mu$  in thickness were stained with haematoxylin and eosin and examined microscopically.

### RESULTS

Grossly, the kidneys appeared in some cases slightly enlarged and oedematous, but did not show any other abnormalities or cystic formations.

Microscopical examination of these kidneys revealed the occurrence of haemorrhage in the papillary region in two cases of CR-length of 18 and 31 cms. In one of these cases haemorrhage was associated with mononuclear round cell infiltration. Four cases exhibited striking morphological changes consisting of intercommunicating cavities of microscopical size and irregular outlines located at the cortico-medullary junction. Undamaged renal tubules and blood vessels, lying in direct contact with the cavities not surrounded by mesenchymal tissue, were seen projecting in these spaces (Fig. 1). Large cavities appeared empty, while small ones may contain traces of albuminous material, erythrocytes or cell fragments. Moderate to high degree of dilatation of the convoluted and straight tubules in the inner cortical zone was observed in almost all cases (Fig. 2). The epithelial lining of these renal tubules in the majority of cases revealed hydropic degeneration, some appeared to be desquamated. The degree of cellular destruction coincided with that of dilatation. The glomeruli located in the outer cortex were usually spared, while the Bowman's capsule and space, especially in these lying in the neighbourhood of the empty cavities described above, were widened and the glomerular tufts were destroyed to its major part. No abnormal increase of mesenchymal tissue was observed at any site in any of the examined cases.

### DISCUSSION

It is known that congenital narrowing or atresia of a ureter may give rise to dilatation proximally, and occasionally hydronephrosis develops (COHRS, 1962; CAPPELL and ANDERSON, 1971). The same effect can also be

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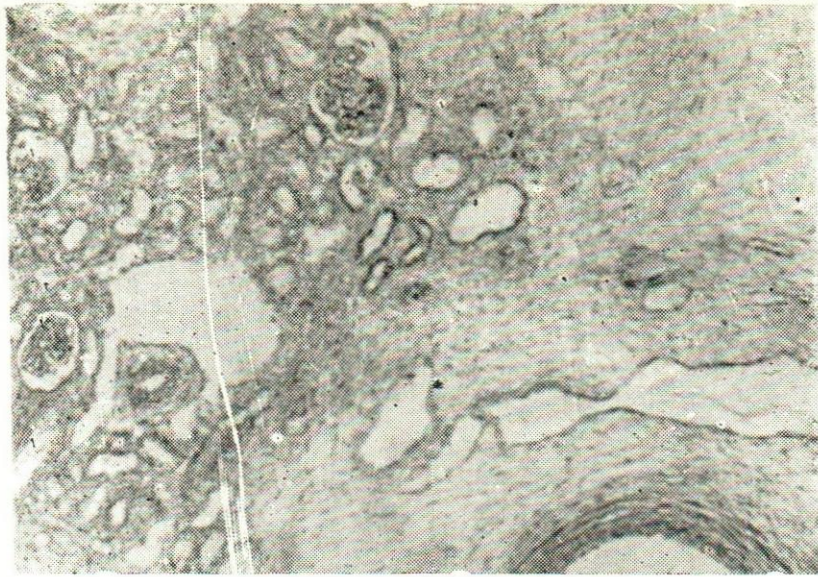
expected when narrowing of the passway of urine through the umbilical cord to the allantoic sac in ruminants takes place, or when there is an increased tension in the allantoic sac due to impaired foetomaternal circulation and exchange of fluid between the allantochorion and the mother. Torsion and spirilling of the umbilical cord, although observed to occur in few cases in buffalo foetuses (DEEB and SALAMA, 1979), may also be a factor in the development of this condition.

Cystic dilatation of the umbilical cord is thought in itself to be of no great significance (DEEB and SALAMA, 1979), but the correlation of this lesion with pathological changes in the kidneys of affected foetuses must receive more attention. Renal changes in these cases consisted of destruction of many tubules and glomeruli especially in the cortico-medullary junction, and the development of microcysts. These changes are probably due to back-pressure impaired by stagnant urine in the urachus. To what extent that such an abnormality favours the occurrence of infection in the postnatal life and its persistence when established, due to the presence of weak damaged renal tissue, is difficult to be stated. Renal infection in the early postnatal life is infrequently observed. Recently, a herd problem associated with renal affection among buffalo calves has been recorded (AMER, *et al.*, 1979), and white-spotted kidney, a pathological condition usually affecting calves, was described (JUBB and KENNEDY, 1970). Moreover, other effects are to be expected; the first is growth retardation, partly from pressure of these cysts on the umbilical vessels during prenatal life, or due to renal failure during the postnatal life. One of the suggested functions of the kidney is to convert the large protein molecule of growth hormone to a smaller, biologically active molecule (AUSTIN and SHORT, 1972). A second effect of these lesions occurring prenatally may also be an electrolyte imbalance as a sequel of renal failure.

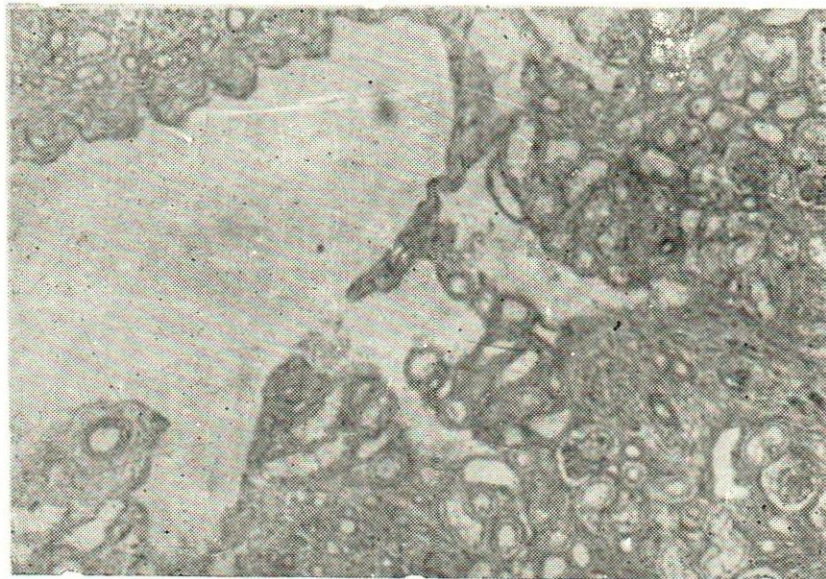
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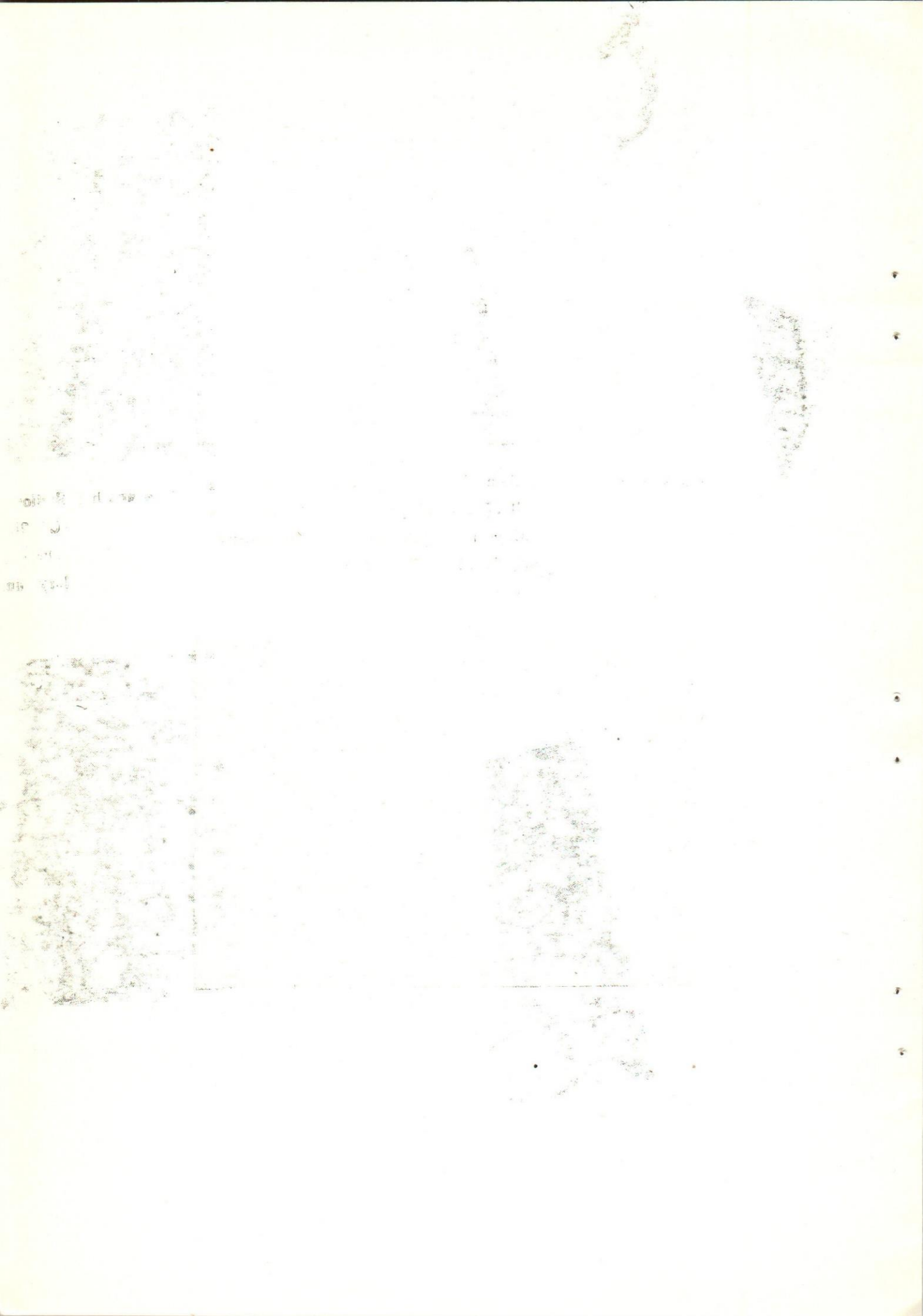
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**Fig. 1 : a and b : Section of the kidney of a buffalo foetus (CR 25 cm) showing an intercommunicating microcysts at the corticomedullary junction. (X 10 x 10)**







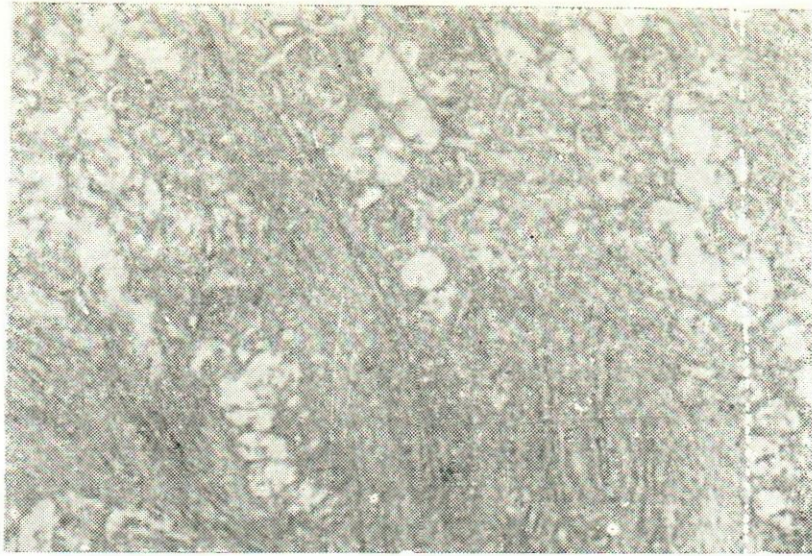


Fig. 2 : a and b : Section of the kidney of a buffalo foetus (CR 19 cm.) Dilatation of the renal tubules and destruction of their epithelial lining. (X 10 x 10).

