

## **HISTOLOGICAL LESIONS OF SLAUGHTERED CALVE'S KIDNEYS IN MOSUL SLAUGHTER HOUSE**

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### **ABSTRACT**

The objective of present study was to investigate the gross and histopathological findings of calves kidneys slaughtered in Mosul abattoir. Pathological examination were carried out on fifty calves' kidneys. The most common gross lesions were included 20% multifocal white spots, 16% enlarged pale kidneys, 20% congested enlarged kidneys , 10% small shrunken kidneys, 14% hyperemic hemorrhagic kidneys, 20% kidneys without any gross lesions. The common observation in the histopathological examination of the kidneys revealed slight to severe mononuclear infiltration were commonly observed, widening of the Bowman's space were common, nephrosis, glomerulonephritis, interstitial nephritis, acute tubular degeneration and necrosis. Cysts were observed also in this study.

### **INTRODUCTION**

The kidneys are complex organs which function is excretion, metabolism, secretion and regulation of body water and salts (1).

Kidneys are susceptible to diseases insults that affect the four major anatomic structures of the kidneys, the glomeruli, tubules, interstitium, and vasculature (2). Most renal lesions are subclinical and they might have remarkably higher frequencies than expected. These lesions result in the poor production of the involved animals (3).

Renal disorder have received much less attention in cattle than in other species and there is still a lack of knowledge in this field (4). Therefore the present study was conducted to investigate the type of renal lesions at calves slaughtered in Mosul abattoir.

### **MATERIAL AND METHODS**

A total number of 25 clinically normal calves were selected from Mosul abattoir.

The 50 kidneys were first examine macroscopically to determine the shape, consistency, size and color of the kidneys.

For microscopic study, kidneys samples were trimmed suitable size and fixed in 10% neutral buffered formalin. After processing the tissue samples washing, dehydrated, in graded ethanol and clearing by xylol and embedded in paraffin, then sectioned with 4-5 micron thickness and stained with hematoxylin and eosin (5), then examined under light microscope.

## RESULTS

The prevalence and types of gross renal lesions are varied from enlargement of kidneys with pale focal to multifocal spots between 1 to 5 millimeter in diameter that were randomly distributed on the surface of kidneys and demarcated from adjacent tissue. Fig.(1) others showed enlarged pale white, other kidneys appeared shrunken pale. Fig. (2) also other kidneys appear congested and hemorrhagic.

The prevalence of histopathological renal changes including acute swelling of epithelial cells lining renal tubules this lead to stenosis of the lumen of tubules (nephrosis) and there was necrosis in other epithelial renal tubules cells. Fig. (3) Other specimens showed focal and diffuse inflammatory cells infiltration (interstitial nephritis). Fig. (4,5). In addition to that there was proliferation of mesangial cells of glomeruli (glomerulonephritis). Fig. (6). Other showed hemorrhage in the interstitial tissue with congestion of blood vessels with dilatation in the lumen of the renal tubules, and there was deposition of eosinophilic material in the interstitial tissue. Fig. (7). Other kidneys showed that there was thickening in the blood vessels wall with presence of hyaline cast in the lumen of other renal tubules. Fig. (8). While other microscopic lesions showed that there was presence of multicyst in the renal tissue (fig 9), also we can see there was partial and complete amyloidosis of glomeruli Fig. (10,11), while other microscopic lesions showed that there was vascular change including congestion of some blood vessels and presence of thrombus in others Fig (12).

In one of kidney specimen showed that there was hemosiderin pigment in the renal tissue Fig.(13). also we observed that there was deposition of calcium salts in the form of clumps and granules in glomerulus of some specimens Fig. (14)

So macroscopic and microscopic lesions of calves' kidney were summarized in table 1

**Table (1) : Type of macroscopic & microscopic lesions of the calves' kidneys.**

Type of macroscopic lesions	Type of microscopic lesions
Focal and multifocal white spots	Focal and multifocal infiltration of inflammatory cells (interstitial nephritis)
Large pale kidney	Nephritis, Degeneration and Necrosis of epithelial cells lining renal tubules (nephrosis)
Small shrunken kidney	Degeneration and Necrosis of epithelial cells lining renal tubules, amyloidosis
Enlarged congested kidney	Glomerulonephritis and thrombus
Hemorrhagic kidney	Hemorrhage in the interstitial tissue, hemosiderin pigment
Without any lesion	Glomerulonephritis, congestion, hyaline cast, amyloidosis



Fig. (1): Kidney calf , Multiple pale , yellow to white (2-5mm) , scattered randomly through out and over the kidney.



Fig. (2): Kidney calf : Shrunken pale kidney.

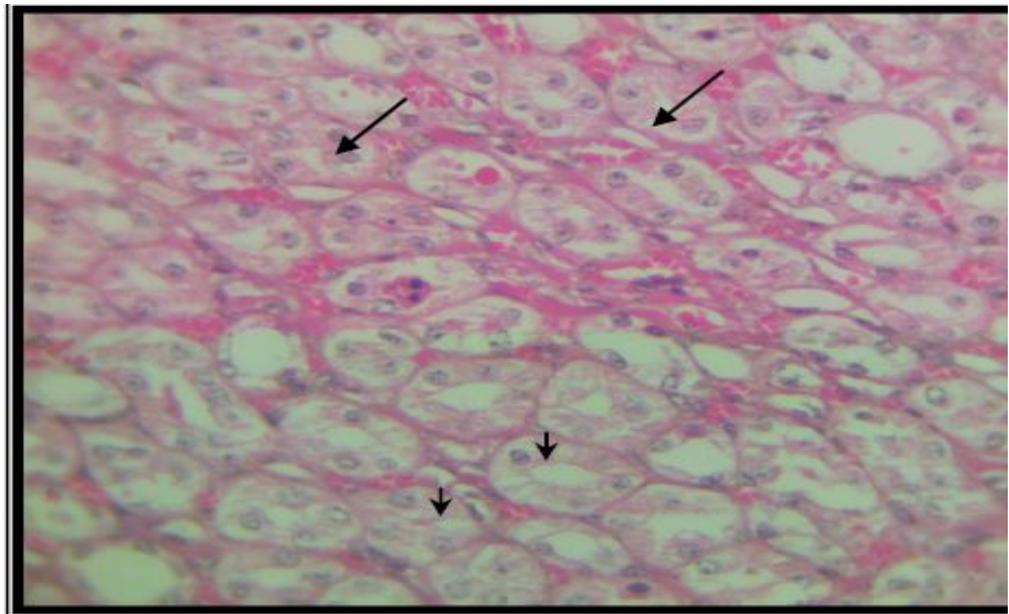


Fig. (3): Section from Kidney of calf , show acute swelling (↔)of epithelial cells lining renal tubules lead lumen stenosis with necrosis(↔)of other tubules . H&E. x420

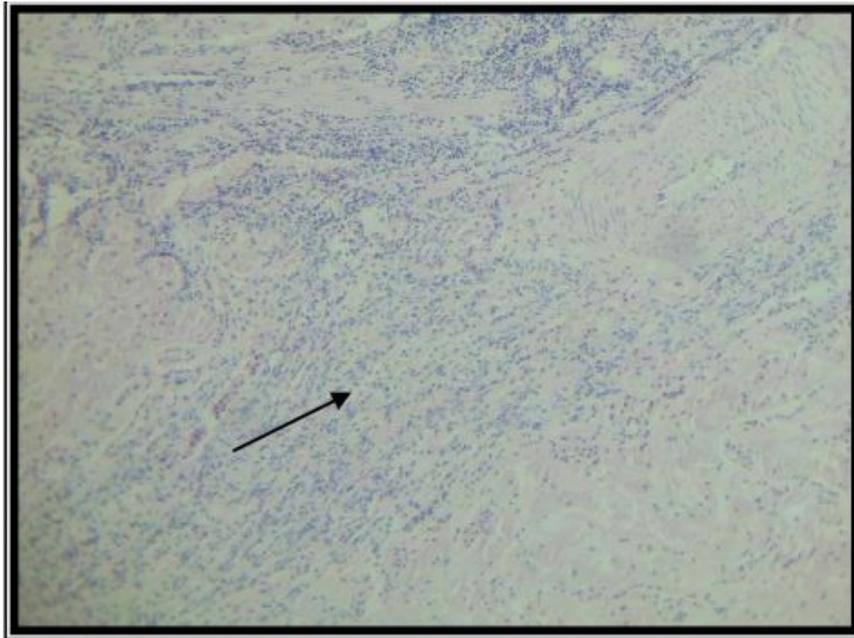


Fig. (4): Section from Kidney of calf , show interstitial nephritis ,with diffuse inflammatory cells infiltration. H&E. x 105

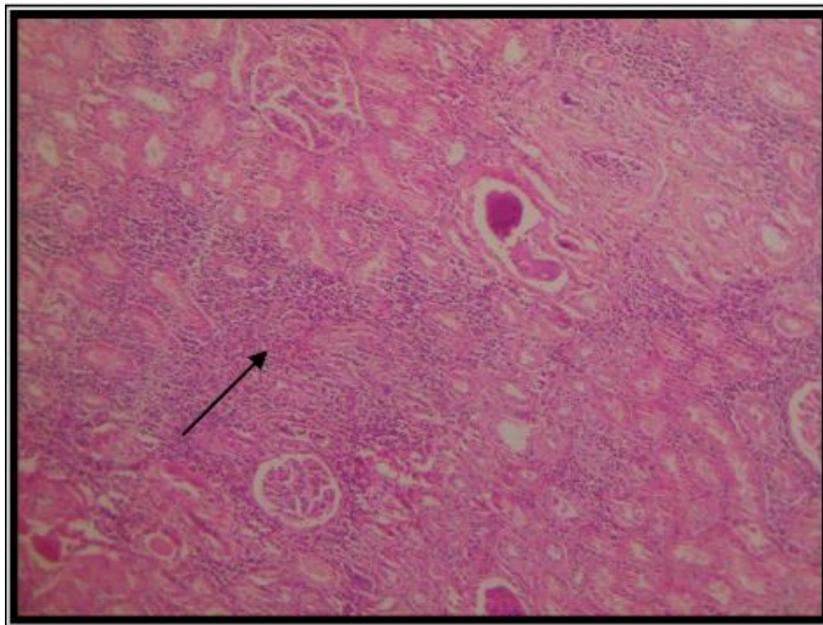


Fig. (5): Section from Kidney of calf , show interstitial inflammatory foci. H&E. x105

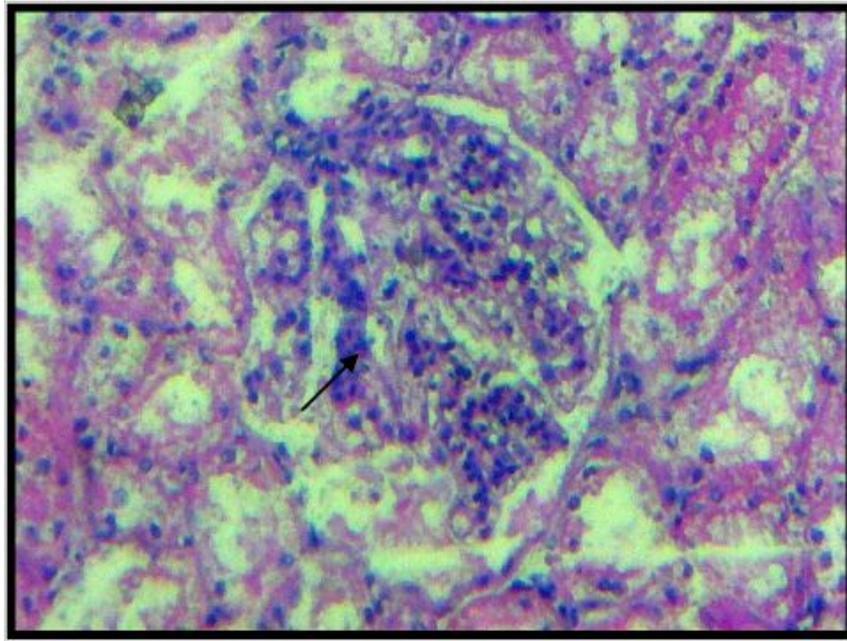


Fig. (6): Section from Kidney of calf , show glomerulonephritis and proliferation of mesangial cells of glomeruli. H&E. x420

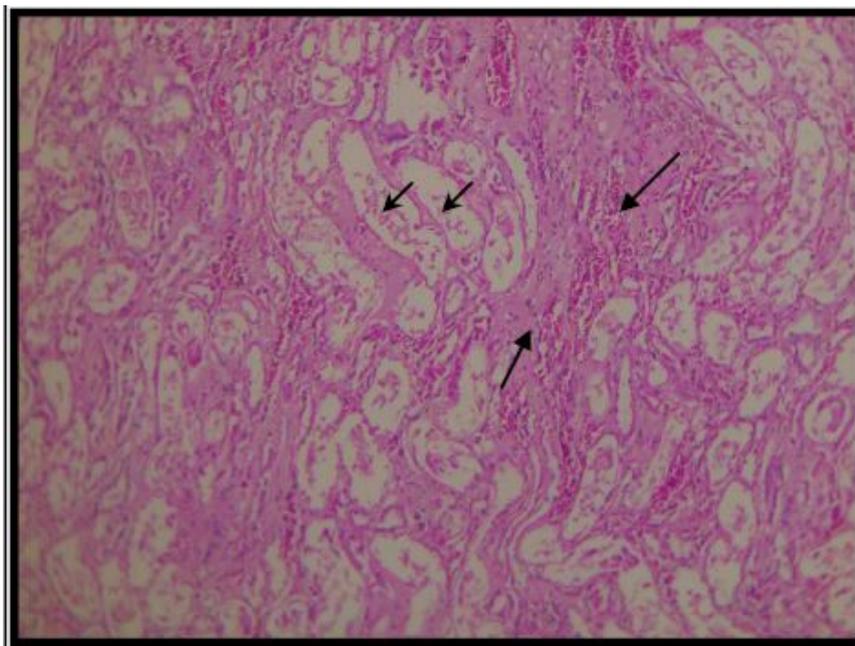


Fig. (7): Section from Kidney of calf , show deposition of eosinophilic material (↖) in the interstitial tissue with dilatation (↙) of renal tubules. H&E. x105

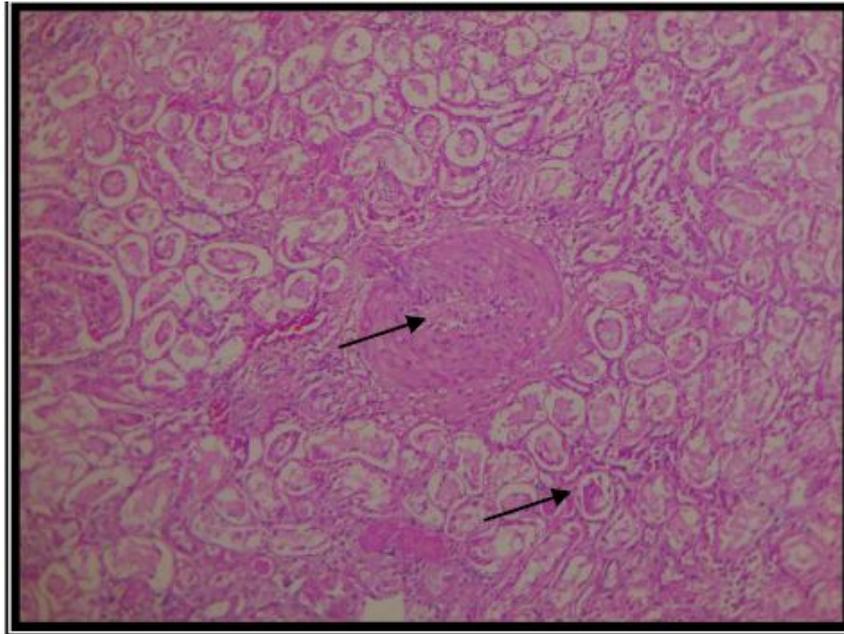


Fig. (8): Section from Kidney of calf , show thickening in the blood vessel wall and hyaline cast in the tubules lumen. H&E. x105

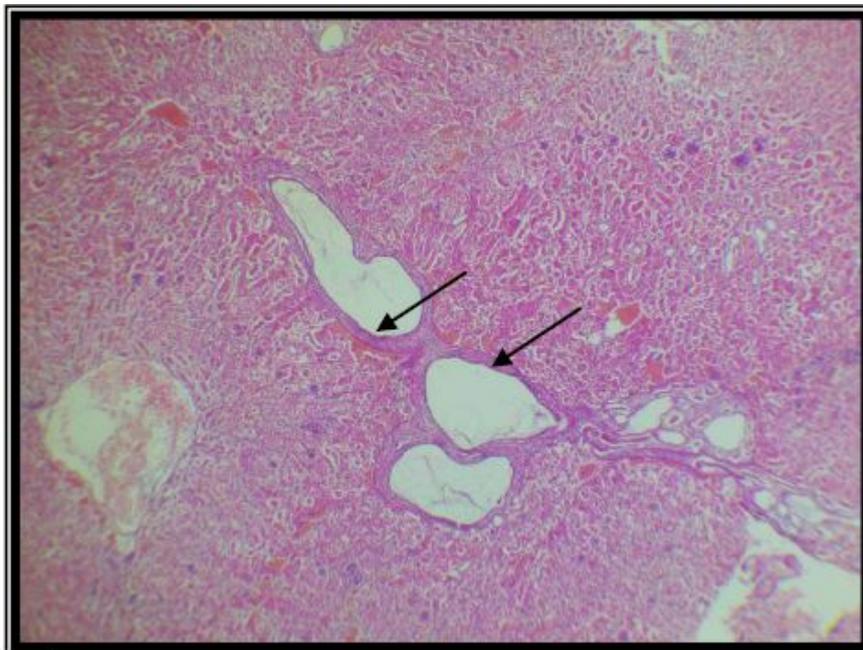


Fig. (9): Section from Kidney of calf , show multicysts in variable sizes lined by flattened epithelium. H&E. x105

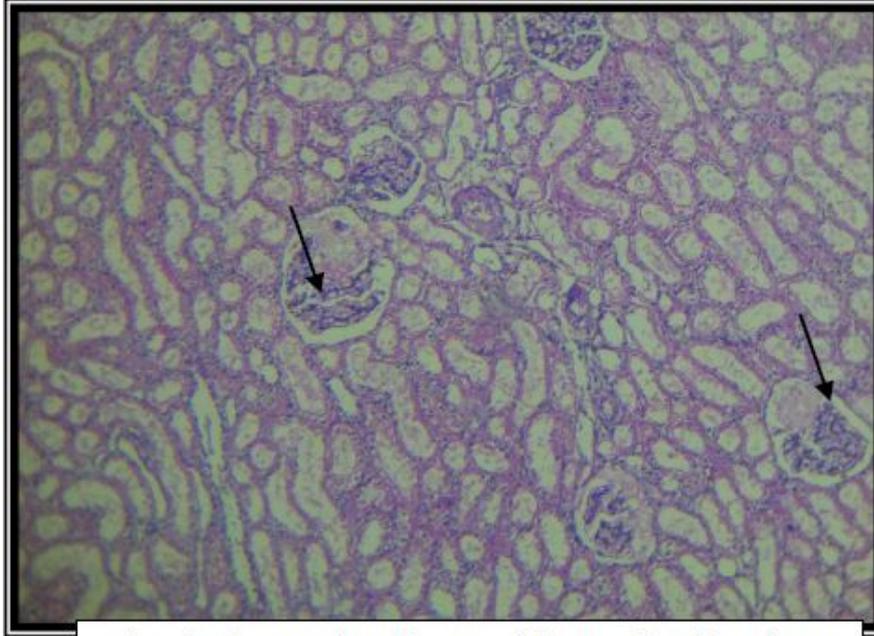


Fig. (10): Section from Kidney of calf , show partial amyloid , the pale eosinophilic homogenous hyalinized deposits. H&E. x105

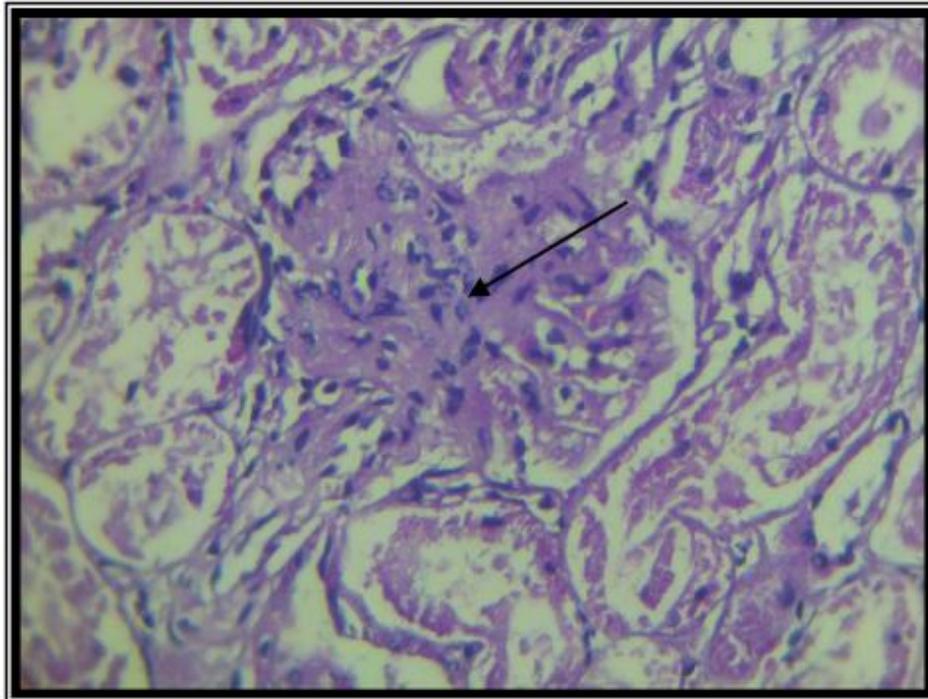


Fig. (11): Section from Kidney of calf glomerulus , all glomerulus tufts are diffusely and notably expanded by amyliod. H&E. x420

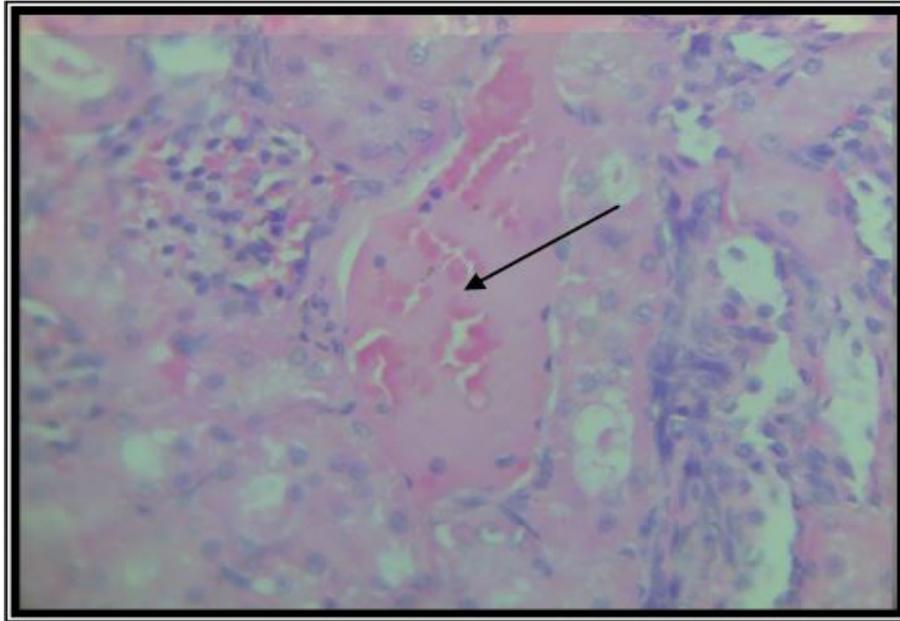


Fig. (12): Section from Kidney of calf , show thrombi in the blood vessels . H&E. x420

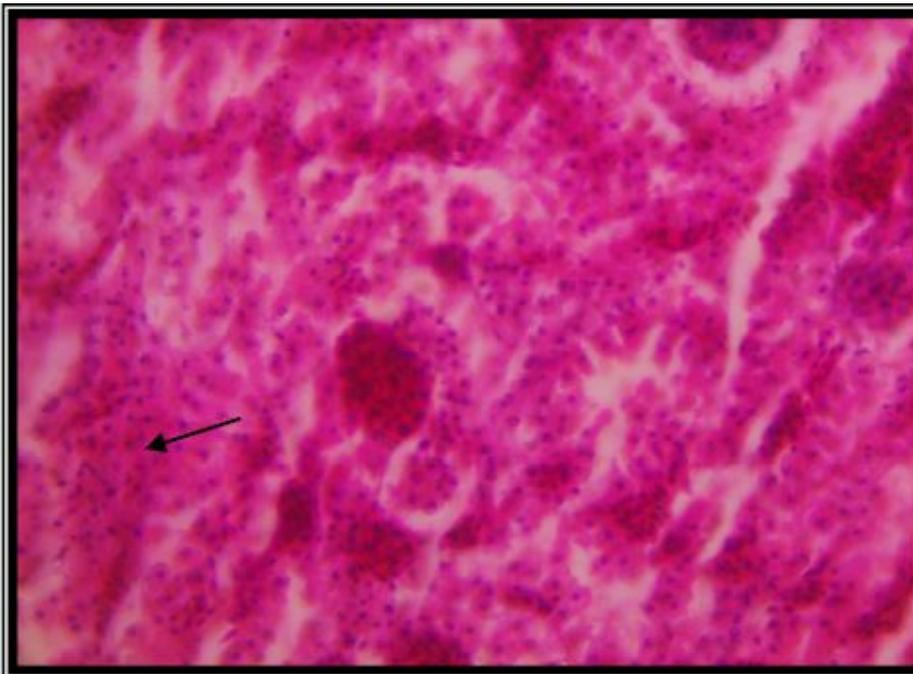


Fig. (13): Section from Kidney of calf , show hemosidrine pigment, deposition of hemosidrine pigment in renal tubule epithelium. H&E. x105

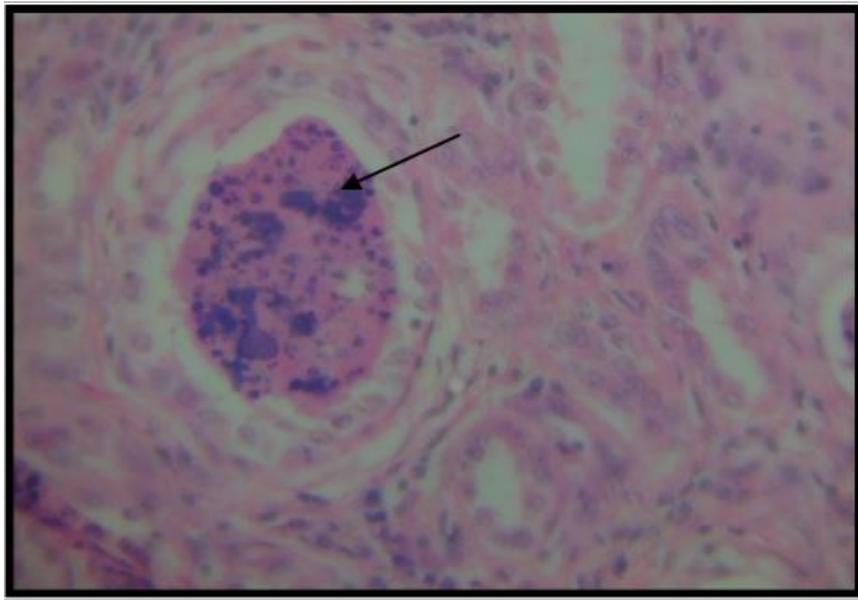


Fig. (14): Section from Kidney of calf , show deposition of calcium salts as granules and clumps in glomerulus. H&E. x420

## DISCUSSION

The results of this study showed that all kidney specimens randomly collected from clinically normal slaughtered animals in Mosul region had renal lesions. The most common gross lesions were enlarged. Renal enlargement may occur due to accumulation of blood, edema, fluid, fat and urine in pelvis or tubules (6). This result agreed with the result stated by (7,8 ) while the hyperemic and hemorrhagic appearance occur due to acute nephritis or occur with septicemia and bacterial intoxication (2), white spotted kidney was the common finding in clinically healthy cattle after slaughter. Although several pathogens can cause this type of lesion it is related to prior *Leptospiriosis* spp. infection (9,7). Also can occur because of *Escherichia coli* septicemia , also other pathogen cause this lesion ( 6) while the pale enlarged kidney occur due to nephrosis ( 2). This result on macroscopic examination also reported by (10). While histological examination revealed that the most common lesion occurred is interstitial nephritis. This may result from bacterial or viral septicemia in which these infectious agents first infect the kidney tubules and the incite an inflammatory response in the interstitium (6). This result was reported in another study at an abattoir in Italy (11). Other histological examination showed degeneration, necrosis of proximal and distal convoluted tubules lining cells which may result from ischemia and toxins (12).This in agreement with (7) , while other

histopathological changes appear in this study includes vascular changes (thrombus, hyperemia, congestion, hemorrhage, thickening of blood vessels wall) these occur as a result of ingestion of toxic plants and substances by the animals or due to inflammatory reactions (2). Otherwise presence of cyst in the kidney this may caused by obstructive lesion or as fundamental change of unknown origin may occur in the tubular basement membrane and result in formation of sacculation or fusiform dilation of tubules (2), This result was reported by (10). The present of amyloidosis is aided by the results of (13,14) . The results showed presence of hemosiderin pigment in the epithelial cells of renal tubules and glomeruli , resulted from degradation of resorbed hemoglobin (2) , While deposition of calcium salts in glomeruli occurs as a result of hypercalcemia or associated with hypomagnesemia of result of secondary hyperparathyroidism (15, 16, 17 ,18) I concluded from the present study that , interstitial nephritis is the most common lesions in calves.

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الآفات النسجية لكلى العجول المذبوحة في مجزرة مدينة الموصل

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## الخلاصة

ان الهدف من الدراسة الحالية هو الكشف عن التغيرات المرضية العيانية والنسجية لكلى العجول المذبوحة في مجزرة مدينة الموصل . تم اجراء الفحوصات المرضية على خمسون كلية . وكانت التغيرات المرضية العيانية الاكثر شيوعاً عبارة عن بقع بيضاء بؤرية بنسبة 20% ، تضخم وشحوب الكلى 16% ، تضخم واحتقان الكلى 20% ، وكلية صغيرة ومنكمشة 10% ، مع وجود نزف على الكلى 14% و 20% كلى بدون أي تغيرات عيانية . كشفت التغيرات المرضية النسجية للكلى وجود ارتشاح طفيف الى شديد للخلايا الالتهابية وحيدة النواة ، توسع حيز بومان مع التهاب كبيبات الكلى ، والتهاب الكلية الخلالي مع تنكس وتنخر للنبيبات الكلوية وكذلك تم ملاحظة وجود اكياس في الكلى خلال هذه الدراسة.

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