BLOOD AND SERUM BIOCHEMISTRY OF OMENTOPEXED WEST AFRICAN DWARF (WAD) GOATS FOLLOWING PERITONEUM SUTURED AND NOT SUTURED LAPAROTOMY

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ABSTRACT

This study investigated the blood and serum biochemistry following peritoneum sutured and not sutured techniques of laparotomy sutures in omentopexed WAD goats. Twenty-five male WAD goats were randomly divided into 5 groups (A – E). In group A, peritoneum was not sutured, while in group B, the peritoneum was sutured alongside with muscle layers. In groups C and D, omentopexy was performed and the laparotomy sutured as in groups B and A, respectively while, group E was the normal control. There was a significant ($p<0.05$) decrease in mean packed cell volume (PCV) (%) and red blood cell (RBC) ($x10^6$µl) counts in all the surgery groups (A, B, C and D) but persisted only in group D till the end of the study - post surgery day (PSD) (day 14) when compared to the control group (E). There was a significant ($p<0.05$) increase in mean total WBC ($x10^3$/µl), neutrophil ($x10^3$/µl) and lymphocyte ($x10^3$/µl) counts in all the surgery groups but persisted only in group D to PSD, when compared to pre-surgery values (PSV) (day 0). The increases in mean total protein (g/dl) and mean albumin (g/dl) in groups A and B were significant ($p<0.05$) in group B goats only on PSD 2 while the significant ($p<0.05$) decreases in these values in group C (peritoneum sutured with omentopexy) and D (peritoneum not sutured with omentopexy) were significant ($p<0.05$) only in goats in group D from 10 to 14 PSD, when compared to PSV. The significant ($p<0.05$) increase in mean blood urea nitrogen (BUN) (mg/dl) in groups A and B persisted till the end of the study, while the significant ($p<0.05$) increase in mean BUN of goats in groups C and D, creatinine (mg/dl) and serum AST (iµ/dl) of goats in all the surgery groups returned to the PSV within the period of the study.

Keywords: Suture techniques, Biochemical, Haematological changes, West African dwarf goats

INTRODUCTION

Among the anatomic tissues that line the abdominal cavity is internally located thin transparent serous membrane that covers the entire visceral organs and part of the pelvic organ termed the peritoneum (Trent, 2004). In ruminant, the peritoneum is modified into

double layered expensive omentum which connects the stomach and other visceral organs (Mosby, 2009). Peritoneum and omentum share the same immunogenic, angiogenic and phagocytic functions in animals (Anderson *et al.,* 1994). It may be because of these functions combined with rapid regeneration of peritoneal cells following damage to the peritoneum that veterinarians depend on its healing property for success of abdominal surgery (Fubini and Ducharme, 2004).

In the same vein, omentum serves as a barrier against infection (Aiello, 1998). It has been in use for revascularisation of ischaemic tissues and in omental transplant to improve wound healing (Goldsmith, 2004).

Omentopexy is the surgical fixation of omentum at the abdominal wall (Kersjes *et al.,* 1985). It is a common surgical practice in ruminants which creates artificial adhesion needed for correction of some visceral abnormalities (Omotainse *et al.,* 1994; Cable *et al.,* 1998). However, omentopexy can lead to visceral adhesions, internal haemorrhage, incision infection, wound dehiscence and delayed wound healing which are added stressors to animals (Fubini and Ducharme, 2004).

Kumar (2002) noted that tissue layers sutured in laparotomy sutures depend on the choice of the surgeons. However, there have been contradicting reports on peritoneum sutured and not sutured techniques as preferred laparotomy suture techniques that encourage quick recovery of animals from surgical stress and trauma. Earlier reports recommended that suturing peritoneum alongside with other tissues such as muscle and or omentum facilitate wound healing and quick recovery from surgical stress (Kersjes *et al.,* 1985)

On the contrary, Kumar (2002) and Fubini and Ducharme (2004) reported that not suturing peritoneum technique minimizes peritoneal tissue damage and reduces visceral adhesion, consequently reduces surgical stress and encourages recovery of animal from stress

Haematology and serum biochemistry are reliable routine pre-surgery laboratory tests and for monitoring post surgery infection, stress, trauma and health improvement (Cole, 1986). Changes in haematology and serum biochemistry following omentopexy, laparotomy and rumenotomy in cows, sheep and goats have been documented (Vlamink *et al.,* 2000; Dehghani *et al.,* 2000; AL-Zghoul *et al.,* 2008). However, variation in these parameters in relation to different tissue closure techniques is scarce. This study comparatively evaluated the post surgery changes in blood and serum biochemistry of male omentopexed West African Dwarf goats following peritoneum sutured and peritoneum not sutured techniques of laparotomy sutures.

MATERIALS AND METHODS

Twenty male WAD goats, aged 6 – 8 months used in this study were procured from local markets (Opi, Orba and Ibagwa) within Nsukka area of Enugu State, Nigeria. They were semi-intensively managed (tethered in the field for grazing on grasses (*Mucuna utilis, Pennicetum purpureum*) in the day and confined in the pen in the evening where their feed were supplemented with grasses and Bambara ground-nut (*Vigna subterrenea* L.) waste. They were allowed to acclimatize for three weeks before the commencement of the experimental protocol. The goats were vaccinated against *Peste des Petits Ruminantum* (PPR) virus using PPR vaccine procured from National Veterinary Research Institute (NVRI), Vom, Jos, Plateau State, Nigeria, and each drenched with levamisole hydrochloride (Hebei Human Pharmacy Limited, China) at a dose of 7.5 mg/kg.

Laparotomy: The goats were randomly assigned into 5 experimental groups (A – E) of 5 goats each. Left-oblique laparotomy, 6 cm long was performed in all the 4 surgery groups (A – D) under xylazine (0.05 mg/kg) pre-anaesthetics given intramuscularly and lignocaine hydrochloride (10 mg/kg) subcutaneously. In group A, muscle layers were sutured together leaving the peritoneum unsutured, while in group B, the muscle layers and peritoneum were stitched together. In groups C and D, omentopexy was performed by anchoring double folds of the greater omental

sac at the transverse abdominal oblique muscle (Kersjes *et al.,* 1985) using size 2/0 nylon (Helmcare, China) suture materials. In addition, tissue apposition was by suturing of muscle and peritoneum layers together in group C while muscle layers were sutured leaving the peritoneum unsutured in group D. The muscle layers and peritoneum were sutured using size 2/0 chromic catgut (Lifecare, India) and in simple continuous suture pattern while skin was sutured using size 2/0 nylon and in horizontal mattress suture pattern.

Blood and Serum Biochemistry: Four millilitres of blood was specifically collected from the jugular vein of each of the goats by venipuncture. One ml each was dispensed in EDTA sample bottle for haematologic evaluation. The remaining 3 ml each was dispensed into a non-anticoagulant plastic sample bottle and allowed for 2 hours to clot. The serum was harvested into clean test tube, centrifuged at 10,000 rpm for 5 min and stored in labelled sample container at -20 ^{0}C for biochemical analyses.

The packed cell volume (PCV) in percentages was determined by microhaematocrit method (Cole, 1986) and the haemoglobin (Hb) concentration (gldl) was determined by cyanomethaemoglobin method (Cole, 1986). The red blood cell (RBC, 10^6/µl) and white blood cell (WBC, 10^3/µl) counts were determined by haemocytometer method, while lymphocyte and neutrophil counts were obtained as described by Schalm *et al.* (1975). The serum total protein, albumin, blood urea nitrogen (BUN), serum aspartate aminotransferase (AST) and creatinine activities were determined using commercially test kit as described by the manufacturer (Randox Laboratories, West Virginia, USA).

Data Analysis: Statistical analysis was conducted on the data obtained using SPSS version 17. The data were analyzed using one way analysis of variance (ANOVA). The variant means were separated using least significance difference (LSD) and the probability value ($p \leq 0.05$) was considered significant. The analysed data were presented in tables.

RESULTS AND DISCUSSION

The PCV and RBC on omentopexed groups (C and D) decreased significantly ($p<0.05$) from post surgery day (PSD) 1 and 3 during the study when compared to the control (Tables 1 and 2). This is probably as a result of pain, exudation, visceral adhesion and other complications of omentopexy that exposed these groups to several stress and haemolysis. Although these complications were not assessed, St. Jean (1990) noted that abdominal disorder can be determined by haematologic observations. Pain may be a sign of omental stress and trauma (Ebeid and Rings, 1999) just as omentopexy can cause incisional complications and internal haemorrhage (Fubini and Ducharme, 2004).

The significant ($p<0.05$) decrease in PCV (Table 1) and Hb (Table 3) of goats in group D on PSD 14 compared to other surgery groups may probably be because of damages done to the visceral tissues of goats in this group since unsutured peritoneum prolongs the visceral complications that subsequently exposed this group to stretched haemolysis. This also agreed with the work of Vlamink *et al*. (2000) who reported significant ($p<0.05$) decrease in PCV following omentopexy for correction of abomasal displacement in cow.

The leucocytosis observed in all the surgery groups (Table 4) might be as a result of significant ($p<0.05$) increase in mean lymphocyte and neutrophil counts (Table 5 and 6) caused by inflammatory response of body systems to surgical trauma, stress and haemolysis. Cheesbrough (2004) noted that leucocytosis and neutrophilia occur in animals as a result of trauma, metabolic disorder, inflammation, and tissue damages.

Dehghani *et al.* (2000) observed leucocytosis and neutrophilia 96 hour following laparotomy in goats. This study indicated significant ($p<0.05$) increase in mean lymphocyte counts of goats in group D on PSD 14 when compared to the control and other surgery group (Table 5). The incision sites where the peritoneum was not sutured might have created a dead space which served as media for infection.

Table 1: Packed cell volume values of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Packed cell volume (%)				
	A	B	C	D	E
0	25.40±1.44^{ab}	27.60±0.81^{a}	25.00±1.38^{ab}	24.60±1.17^{ab}	27.33± 0.88^{a}
2	22.20±1.46^{ab}	25.80±1.16a	21.68± 1.69^{b}	22.00±1.30^{ab}	26.33± 0.88^{a}
6	20.25±0.95^{b}	25.75±0.85^{ab}	19.50±0.29^{c}	18.50±0.29^{c}	26.67± 0.88^{a}
10	21.33± 0.33^{b}	25.00±1.00^{ab}	21.00.±1.53^{c}	18.50±0.29^{c}	25.33± 1.46^{ab}
14	22.00±0.00^{ab}	26.33±1.20^{a}	23.33±0.67^{ab}	17.00±0.58*^{d}	25.33±1.46^{ab}.

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 2: Red blood cell counts of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Red blood cell counts (x10^6/µl)				
	A	B	C	D	E
0	3.86± 0.08^{ab}	4.44± 0.17^{b}	4.32± 0.13^{b}	4.36± 0.22^{b}	4.27± 0.08^{b}
2	3.24± 0.14^{a}	4.16±0.18^{b}	3.22± 0.29^{a}	3.18± 0.26^{a}	4.63±0.12^{b}
6	3.10± 0.14^{a}	4.05±0.12^{b}	3.02± 0.23^{a}	2.97± 0.23^{a}	4.70± 0.05^{b}
10	3.17± 0.28^{a}	4.37± 0.07^{b}	3.03± 0.31^{a}	3.00± 0.36^{a}	4.76±0.07^{b}
14	3.20± 0.30^{a}	4.43±.0.03^{b}	3.07± 0.33^{a}	2.77± 0.23^{a}	4.87± 0.03^{b}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 3: Haemoglobin concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Haemoglobin concentration (g/dl)				
	A	B	C	D	E
0	7.94± 0.50^{a}	8.50± 0.49^{a}	8.78± 0.25^{a}	8.16±0.50^{a}	8.53± 0.15^{a}
2	7.68± 0.45^{a}	8.44±0.42^{a}	7.44± 0.76^{a}	7.26±0.23^{a}	10.03±0.55^{c}
6	7.58± 0.23^{a}	7.88± 0.45^{a}	7.10± 0.49^{a}	6.88±0.15^{a}	9.70± 0.30^{a}
10	7.87±0.47^{ab}	8.57± 6.37^{a}	6.57± 0.97^{b}	6.67±0.07^{b}	8.83± 0.77^{a}
14	8.10±0.46^{ac}	8.57±6.37^{a}	7.00±1.30^{ab}	5.37±0.13^{b}	9.33± 0.75^{c}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 4: White blood cell counts of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	White blood cell counts (x10^3/µl)				
	A	B	C	D	E
0	12.31±0.67^{a}	12.36±2.52^{a}	12.69±3.94^{a}	13.07±4.77^{a}	12.92±0.42$_{a}$
2	18.50±1.35^{c}	15.15±0.86^{b}	18.4±1.12^{c}	13.57±1.88^{a}	12.03±1.44^{a}
6	11.20±0.53^{a}	11.53±2.62^{a}	21.18±0.75^{c}	13.84±1.67^{a}	13.32±1.69^{a}
10	11.97±3.330^{a}	14.00±1.56^{ab}	11.72±0.36^{a}	14.33±0.75^{ab}	12.12±2.81^{a}
14	13.62±0.67^{a}	13.57±2.78^{b}	11.73±2.58^{a}	18.07±1.45^{c}	13.82±1.09^{a}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 5: Lymphocyte counts of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Lymphocyte counts (x10^3/µl) A	B	C	D	E
0	8.36±2.20^{a}	8.25±1.37^{a}	7.98±3.50^{ab}	9.13±3.30^{ab}	8.90±0.68^{ab}
2	11.58±7.82^{a}	9.65±5.13^{b}	12.79±6.71^{c}	8.52±1.26^{ab}	8.64±1.36^{b}
6	7.36±0.60^{a}	7.61±1.20^{a}	12.80±4.25^{c}	8.04±1.53^{b}	7.27±1.22^{a}
10	8.43±2.22^{a}	9.65±0.96^{a}	10.48±4.12^{b}	9.94±0.59^{a}	8.06±1.88^{a}
14	9.43±5.00^{a}	12.70±2.16*^{a}	8.09±1.72^{a}	10.87±1.13^{c}	9.17±1.26^{a}

Different superscripts $^{a, b, c}$ varies significantly (p<0.05) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 6: Neutrophil counts of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Neutrophil counts (x10^3/µl) A	B	C	D	E
0	3.00±0.44^{a}	3.62±0.51^{a}	3.60±0.51^{a}	3.77±0.14^{a}	3.51±0.41^{a}
2	6.92±0.21^{c}	5.12±0.30^{b}	6.60±0.33^{c}	4.85±0.86^{ab}	3.39±0.13^{a}
6	3.70±0.51^{a}	3.30±0.69^{a}	7.96±0.32^{c}	6.31±0.39*^{b}	3.87±0.75^{a}
10	3.36±0.10^{a}	4.15±0.43^{ab}	5.21±0.21^{b}	4.30±0.84^{ab}	3.66±0.72^{ab}
14	4.91±0.0.19^{ab}	4.55±0.63^{ab}	3.41±0.84^{a}	5.99±0.06^{b}	3.22±0.45^{a}

Different superscripts $^{a, b, c}$ varies significantly (p<0.05) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 7: Serum total protein concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Serum total protein concentration (g/dl) A	B	C	D	E
0	6.44± 0.22^{a}	6.38± 1.15^{a}	7.92± 0.36^{b}	7.76±0.56^{bc}	7.76±0.56^{bc}
2	6.90± 0.15^{a}	8.60±0.32^{bc}	6.82± 0.83^{a}	7.68± 0.68^{a}	10.13±0.34^{b}
6	6.83± 0.15^{a}	6.65±0.15^{a}	6.50± 0.76^{a}	6.90± 0.49^{a}	9.90± 0.15^{b}
10	6.70± 0.75^{a}	6.90± 0.15^{a}	6.47± 0.95^{a}	3.07± 0.31^{b}	10.16±1.12^{c}
14	7.47± 0.45^{a}	7.77±.0.97^{a}	8.27± 0.22^{a}	5.17± 0.03^{b}	10.47±0.95^{c}

Different superscripts $^{a, b, c}$ varies significantly (p<0.05) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 8: Serum albumin concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Serum albumin concentration (g/dl) A	B	C	D	E
0	3.20±0.10^{ac}	3.38±0.21^{c}	3.22±0.08^{ac}	2.90±0.22^{bc}	3.47±0.15^{c}
2	2.84±0.12^{bc}	2.98±0.12^{a}	3.22±0.08^{abc}	2.48±0.04^{bc}	3.80±0.60^{d}
6	3.33±0.27ac	3.88±0.23^{a}	2.43±0.42^{bc}	1.85± 0.10^{b}	3.13±0.09^{ab}
10	2.83±0.41^{a}	3.07±0.09a	2.40±0.06^{ab}	1.83±o.35^{b}	3.00±0.06^{a}
14	2.87±0.09^{ab}	3.23±0.41^{ac}	2.90±0.90^{bc}	2.33±0.03^{bc}	3.67±0.24^{b}

Different superscripts $^{a, b, c}$ varies significantly (p<0.05) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 9: Blood urea nitrogen concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Blood urea nitrogen concentration (mg/dl)				
	A	B	C	D	E
0	33.74±3.11^{a}	32.78±4.58^{a}	33.80±5.87^{a}	31.40±5.06^{a}	43.40±6.17^{a}
2	70.80± 3.26^{a}	56.60±8.61^{ac}	55.20±4.35^{b}	46.00±6.16^{bc}	55.67±6.98^{ac}
6	78.00± 4.33^{a}	50.00± 5.29^{b}	32.00±4.09^{c}	37.25± 1.49^{c}	59.33± 1.45^{b}
10	79.67± 3.75^{a}	49.67± 6.12^{b}	33.67±1.45^{c}	37.67± 0.33^{c}	61.67± 5.36^{b}
14	61.00± 2.66^{a}	59.33± 3.92^{a}	37.67±3.48^{b}	35.00± 0.58^{b}	58.33± 9.17^{a}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 10: Creatinine concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Creatinine concentration (mg/dl)				
	A	B	C	D	E
0	1.86± 0.10^{a}	1.66±0.14^{ab}	1.54±0.08^{ab}	1.44±0.16^{ab}	1.37± 0.03^{ab}
2	2.44± 0.26^{a}	1.96±0.14^{ac}	1.54±0.08^{ab}	1.22±0.15^{b}	1.77±0.09^{bc}
6	2.48± 0.25^{a}	1.75±0.06^{ab}	1.18±0.09c	0.95±0.06^{c}	1.80± 0.23^{a}
10	2.43±0.23^{a}	1.63±0.32^{ab}	1.30± 0.31^{b}	0.87±0.03	1.67±0.34^{ab}
14	1.90±0.40^{a}	1.17±.0.18^{b}	1.27±0.03^{b}	0.97±0.03^{b}	1.87± 0.09^{a}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Table 11: Serum aspartate aminotransferase concentration of omentopexed WAD goat following peritoneum sutured and not-sutured laparotomy

Post Surgery Day (PSD)	Serum aspartate aminotransferase concentration (iμ/dl)				
	A	B	C	D	E
0	82.20± 8.41^{a}	67.60±7.13^{ac}	42.80± 3.66^{b}	62.20± 9.26^{bc}	50.33±5.21^{abc}
2	97.00±7.56^{ac}	108± 6.52^{a}	53.00± 13.24^{b}	71.40± 8.37^{bc}	64.33± 5.48^{b}
6	54.25± 7.94^{a}	65.50± 4.05^{a}	65.75± 8.76^{a}	62.25± 13.61^{a}	68.67±17.13^{a}
10	51.00± 5.29^{a}	39.33± 1.67^{a}	100.67± 0.66^{b}	90.00± 0.577^{b}	52.67±12.25^{a}
14	70.00±3.21^{a}	54.33± 15.96b	57.43±8.11^{ab}	63.33±7.29^{a}	69.00±5.69^{a}

Different superscripts $^{a, b, c}$ varies significantly ($p<0.05$) across the groups. A = peritoneum unsutured, no omentopexy; B = peritoneum sutured, no omentopexy; C = peritoneum sutured + omentopexy; D = peritoneum unsutured + omentopexy; E = control

Following infection, animals are bound to fight the invader and therefore physiologically respond by lymphocytic proliferations. Leucocytosis has been attributed to increase in lymphocyte counts after rumenotomy in goats (Orgbanyi, 2006). Ihedioha and Chineme (2004) also noted that lymphocytosis may indicate recovery from infections.

There was a significant ($p<0.05$) decrease in the mean total protein (Table 7) and mean albumin (Table 8) compared to the control. This might be associated with pain and surgical stress as reported by Omotainse *et al.* (1994).

The significant ($p<0.05$) decrease in the mean total protein and albumin of goats in group D might be due to complication of omentopexy combined with peritoneum not sutured which may have resulted in pain, anorexia, and altered metabolism. Hypoalbuminaemia can result from increased catabolism in acute phase of reaction, protein loss and imbalance between extravascular and intravascular compartment (Omotainse *et al.,* 1994; Peters, 1996). The significant ($p<0.05$) increase in the mean BUN values (Table 9), creatinine levels (Table 10) and serum AST activities (Table 11) signify catabolic breakdown of tissues and muscle degeneration following surgery.

Degeneration of these muscles at the wound sites resulted in the consequent release and increase of these organ damage markers in the blood. Similar findings have been reported (Cole, 1986; Omotainse *et al.,* 1994). Dehghani *et al.* (2000) reported significant ($p<0.05$) increase in mean BUN levels and serum AST activities after laparotomy in WAD goats. Similarly, AL-Zghoul *et al*. (2008) reported increase in mean BUN, creatinine and serum AST activities following elective castration in sheep. The significant ($p<0.05$) decrease in the mean creatinine levels of goats in groups C and D might be as a result of inappetence and anorexia associated with pain and severe trauma of omentopexy in these groups. AL-Zghoul *et al*. (2008) noted a decrease in mean creatinine level following omentopexy in dairy cow. It was concluded that peritoneum sutured technique has minimal blood and serum biochemical complications and should be advocated for during laparotomy sutures.

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