OBSERVATIONS AND RESULTS

Observations were made on the wounds of all the three groups of animals for gross changes till the complete healing of wound. The efficacy of different treatment of cow urine on wound healing was assessed on the basis of gross examination of wound healing, determination of percent area of wound contraction, histomorphological and histochemical studies at different time intervals.

GROSS OBSERVATIONS:

GENERAL APPEARANCE:

The wounds of all the three groups were kept under strict observations everyday. On 1st day of observation, there was clotting of blood in all groups. On 2nd day of observation, the wound surface in group I and II appeared moist and pink in colour but in group III, the wound surface was wet and pinkish. In group I and II, nothing could be seen exuding from wound surface, but in group III exudation was present with some offensive smell. In group I and group II, scabbing started on day-5 to 6 and it could be completed in day-12 to 13 in group II and day-15 to 16 in group I. while in group III, scabbing started on day-8 to 10 and completed on day-20 to 22. Sloughing of scab started on day- 15 to 16 and
completed on day- 20 to 22 in group II, but the sloughing was yet not completed in any other group during this period.

**INFLAMMATION:**

Severe inflammatory reaction up to 3\textsuperscript{rd} day and moderate degree of inflammation up to 5-6\textsuperscript{th} post wounding day could be observed in both group I and II, whereas, signs of severe inflammation were discernible in group III up to 7\textsuperscript{th} day and the moderate degree of inflammation was conspicuous for a period of 15 to 16 days.

**APPEARANCE OF GRANULATION TISSUE:**

In group II, which was treated with cow urine topically and orally, granulation tissue appeared earlier on day-3 as compared to group I where granulation tissue could be noticed on day-4 to 5. In group III, it could be observed on an average by day-7.

**FILLING OF WOUND GAP:**

Nearly two third depth of the cavity of wounds was filled with granulation tissue by day-7 to 9 in both group I and II. However complete filling of wound cavity was a bit faster in group II as compared to group I. There was complete filling of wound cavity by 10 to 11 days in group II whereas it took 11 to 12 days in group I. In group III, about one third gap was filled by day- 10 to 12 and one half by day 14 to 15.
COMPLETION OF EPITHELIALIZATION

Intense epithelialization occurred in the wounds of group II, followed by group I and group III, in that order. Complete epithelialization over granulation tissue was observed to take place on day 17 to 20 in group II, whereas it was completed by day 18 to 21 in group I. Very little scar mark was present in the wounds of group I and II. In group III, wounds were found to be healed completely by epithelialization after day 30 to 32, leaving a marked scar.

EASE OF APPLICATION AND REMOVAL OF DRESSING:

In all groups, the dressing gauze got adhered to the healing tissues, which required moistening before its removal. The separated gauze in group I and II was devoid of any offensive smell, but there was some foul smell and pus with adhered dressing gauze in group III. Adhering of dressing gauze with healing tissue persisted for longer period in group III. The dressing agent was found not to be irritating or eliciting pain, when applied on the wound and no any untoward effect was seen after oral administration.

WOUND CONTRACTION:
Study on percentage wound contraction was done on day-7, 14 and 21. A significant variation (P<0.01) in wound contraction was observed at different periods of observation in all the three groups (Table-2.2a). There was an increasing trend in wound contraction, the maximum (94.47±0.53) being achieved on day 21 of observation in group II and the minimum (24.30±0.93) was observed on day-7 in group III (Table-2.1). Group-wise analysis of data for wound contraction showed a significant variation (P<0.01) for different groups (Table-2.2a). On day-7 of observation, group I (28.53±0.52) and group II (30.22±0.36) differed significantly with that of group III (24.30±0.93). However, group I and group II did not differ significantly with each other. On day-14 of observation, group I (66.97±0.58) and group II (70.47±0.33) differed significantly with that of group III (57.30±1.40). However, group I and group II did not differ significantly between themselves. On day-21 of observation, group I (89.90±0.50) and group II (94.47±0.53) differed significantly with that of group III (77.81±0.37). However, group I and group II did not differ significantly between themselves (Table-2.2). Thus it is explicit that the percentage wound contraction at the observation period of 7, 14 and 21 days in group I and II did not vary significantly
between themselves however, they differed significantly with group III at the corresponding period of observation.

**HISTOMORPHOLOGICAL OBSERVATIONS**

**EPITHELIALIZATION:**

Statistical analysis of data showed that there was increasing trend in epithelilization at different period of observation within the group (Table-3.1). Epithelialization exhibited a significant variation (P<0.01) during periods of observation in group II and group III but the variation was non significant in group I (Table-3.1a). Group-wise analysis of data revealed that variation among groups on day-7 was non-significant but it was significant (P<0.01) at other periods of observation (Table-3.2a). On day-14 of observation, group I (2.22±0.12) and group II (2.39±0.10) altered significantly with that of group III (1.62±0.10). Similarly, on day-21 of observation, group I (2.50±0.07) and group II (2.84±0.10) varied significantly with that of group III (2.09±0.09). However, group I and group II did not differ significantly between themselves.

**FIBROPLASIA:**

A significant alteration could be observed during the process of fibroblastic proliferation (Table 4.1a). Within a group, the process of fibroplasia increased with the increase in period of
observation, with highest intensity seen on day-21 of observation. On day-7 of observation, group I (2.27±0.08) and group II (2.66±0.10) altered significantly with that of group III (0.91±0.07). On day-14 of observation, group I and group II altered significantly with that of group III. On day-21 of observation, group I and group II altered significantly with that of group III (Photo-7, 8 & 9). However, group I and group II never differed significantly between themselves at any period of observations (Table-4.2). Group-wise analysis of data for fibroplasias showed a significant variation (P<0.01) for different groups at different period of observations (Table-4.2a)

**NEOVASCULARIZATION:**

The variation in the quantum of neovascularization were statistically significant (P<0.01) with the period of observations (Table-5.1a). In all groups, the intensity of neovascularization increased from day-7 to day-14 and thereafter it decreased on day-21. The regeneration of new capillaries in group I recorded at different periods of observation was statistically significant among themselves with maximum intensity seen on day-14 (2.31±0.10) of observation. In group II and group III, the intensity of neovascularization on day-7 differed significantly with those on day-14 and day-21 (Table-5.1). Overall analysis of data revealed
that the highest intensity of neovascularization was found in group II (2.70±0.06) on 14th day of observation (Photo-4, 5 & 6). Group-wise analysis revealed that variation among groups on day-21 was non-significant, but it was significant (P<0.01) at other periods of observation (Table-5.2a).

**INFILTRATIVE CHANGES:**

Infiltrative changes exhibited a significant variation (P<0.01) at different periods of observation in all the three groups (Table-6.1a). Infiltrative changes were more pronounced on day-7 and thereafter reduced gradually by day-21 in all groups (Photo-1, 2 & 3). Group I and III differed significantly with group II on day-14 and day-21 of observation while on 7th day of observation group I and II differed significantly with that of group III (Table- 6.2). Group-wise analysis showed that the alteration in infiltrative changes was highly significant among groups (Table-6.2a).

**COLLAGEN FIBRES:**

Statistical analysis of data showed that there was a significant variation (P<0.01) in the quantum of collagen fibres discernible at different periods of observation (Table 7.1a). There was an increasing trend in the intensity of collagen fibres among all the groups at different periods of observation; the maximum being noticed on day-21 of observation. Group-wise analysis of data for
quantum of collagen fibres as observed histomorphologically, varied significantly (P<0.01) at different periods of observation (Table-7.2a). Group I and group II differed significantly with group III at all period of observation, but a nonsignificant alteration could be noticed between group I and group II (Table 7.2).

**HISTOCHEMICAL OBSERVATIONS:**

**COLLAGEN FIBRES:**

A significant variation (P<0.01) in the intensity of collagen fibres was noted during the periods of observation (Table-8.1a). It followed an increasing trend in all the groups (I, II and III) and the maximum intensity could be recorded on day-21 in group II as revealed by histochemical examination (Photo-10, 11 & 12) (Table-8.1). Group I and group II differed significantly with group III throughout the observation period, but the variation in group I and group II did not differ significantly (Table-8.2). Group-wise analysis revealed that the variation among groups was significant (Table-8.2a). Group II excelled in collagenation followed by group I and least in group III.

**ELASTIC FIBRES:**

Elastic fibres exhibited a significant variation (P<0.01) during periods of observation (Table-9.1a). It followed an increasing trend with increase in time in all the groups, with
maximum intensity being observed on day-21. On day-7 of observation, the intensity of elastic fibres in group II was significantly higher than that of group I and III (Table-9.2). However, on day-14 and day-21 of observations, there was no significant alteration among the groups. In group II, a significant difference could be noticed between day-21 and day-14 or day-7, but no significant alteration could be recorded between day-7 and day-14 of observations (Table-9.1). Group-wise analysis of data showed the significant variation (P<0.01) in elastic fibre formation (Table-9.2a).

**RETICULAR FIBRES:**

There was a significant variation (P<0.01) in the development of reticular fibres during the different periods of observation (Table- 10.1a). In all groups, the quantum of reticular fibres increased with the increase in observation time and the maximum fibres could be recorded on 21st day of observation. The quantum of reticular fibres on day-7 of observation differed significantly with that on day-14 and -21 in group I. While in group II and III, the quantum of reticular fibres differed significantly among themselves at different periods of observation (Table-10.1). Group-wise analysis exhibited a non-significant variation on day-7
of observation, but it varied significantly at other periods of observation (Table-10.2a).