Descent of the testis from an intra-abdominal site in foetal life to an extracorporeal location after birth is a mandatory developmental process to ensure that the mature testis promotes normal spermatogenesis. The cattle has fully descended testis during early gestation whereas it is delayed after birth in dog. Some of the studies have been conducted on the bull (Hullinger and Wensing 1985), buffalo (Baishya and Vyas 1991) and goat (Farooqui et al., 2011) during prenatal life, but sequential changes are still lacking in buffalo, which prompted this present study.

**MATERIALS AND METHODS**

The present study was conducted on the testis of 18 buffalo foetii of 9.0 cm-96.0 cm CVRL which were obtained from abattoir and Veterinary Clinics. The approximate age of the foetii was calculated by using the following formula (Soliman, 1975).

\[
Y = 28.66 + 4.496 X \quad (CVR < 20 \text{ cm}) \\
Y = 73.544 + 2.256 X \quad (CVR \geq 20 \text{ cm})
\]

Where \(Y\) is the age in days and \(X\) is the CVR in centimeters.

Based on CVR the samples were divided into three groups viz; Group I: Foetal samples of CVR between 0 cm to 20 cm Group II: Foetal samples of CVR between 20 cm to 40 cm Group III: Foetal samples of CVR > 40 cm. The undescended and the descended testes were collected by dissecting the abdominal cavity and the scrotum, respectively. Immediately after collection, the tissue samples were fixed in 10 % neutral buffered formalin and Bouin’s fixatives. Various observations were recorded on the location of testis in the abdomen, inguinal and scrotal regions.

**RESULTS AND DISCUSSION**

In the present study, there were different phases of descent of testis observed at different age groups as transabdominal and inguin-oscrotal descent. The inguin-oscrotal descent can be further divided into inguinal and scrotal descent as described by Baishya and Vyas (1991) in buffalo.

**Transabdominal descent:** This stage was observed at early age in group I, in which both the testes were present in the abdomen at 8.0 cm CVRL at the latero-ventral aspect on the caudal end of kidneys. It was observed that at 11.0 cm CVRL, the left testis was related ventro-medially to the stomach, while the right one to the coils of intestines. The shape of the testis was rounded to oval with rounded extremities. At 19.0 cm CVRL, the testis started moving towards the lower abdomen near the deep inguinal ring. Krehbiel (1961) also observed that the testis was ventral to the anterior half of the metanephros at 55 days gestation, and moved posteriorly to the internal inguinal ring by 101 days gestation in bovines. Similar findings have been reported by Bashiya and Vyas (1991) and Mazaheri et al. (2005) in buffalo foetus. Hullinger and Wensing (1985) observed that the testes were present at the deep inguinal ring by week 15 in Dutch Friesian foetuses and Mazaheri et al. (2004) observed intra-abdominal descent at about CRL 20 cm prenatally in buffalo foetus.
**Inguino-scrotal descent:** In group II, the testes were elongated in shape and were slightly away from the caudal pole of the respective metanephros. The left testis was present slightly at a lower level than the right one and was related with the coils of the small intestine while the right one was related with the dorsal lobe of liver. The lateral surface of both the testes was slightly convex while the medial one was relatively flat. The proximal extremity was rounded and narrower than the distal one, which was related to the cauda epididymis. At 36.5 cm CVRL, testis descended more towards the inguinal ring in caudal direction and at 45.0 cm CVRL and the descent was further towards the inguinal canal, which might be due to the growth of the body and enlargement of adjacent organs. This process continued and referred as inguinal migration (Baishya and Vyas 1991).

In group III, at 60 cm CVRL, the testes started descending towards the scrotal sac. These were found to be fully descended by 75.0 cm CVRL and were covered by tunica vaginalis, fascia and skin. It was also reported that the lateral surface of testes was more convex than the medial one. The anterior border was convex whereas, the caudal border was flat and attached to the corpus epididymis as reported by Baishya and Vyas (1991), who mentioned that the inguinal migration occurred at 22.0-42.5 cm CVR and that of scrotal migration at 51.0-62.0 cm CVR in buffalo during prenatal life. Similarly, Gier and Marion (1970) observed that the testes passed the inguinal ring in the foetal sheep at about 80 days, in bull at 100th-105th days, in pig at 100th-110th days and in horse at about 10 months. Farooqui et al. (2011) observed that the testes were situated in the inguinal canal from 89th to 95th day and scrotal migration was reported from 90th day onwards in goat foetus. The process of external abdominal descent may be due to shortening of the gubernaculum to draw the testis into the scrotum, the formation of the recessus vaginalis and the inguinal canal, severe abdominal pressure and the action of gonadotrophic hormones.

In buffalo foetus, the testes were found to undergo a transformation stage of rounded to oval testes between 8.0 cm CVRL to 36.5 cm CVRL, then from oval to elongated from 45.0 cm CVRL onwards. Mazaheri et al. (2005) also studied that the shape of testis was sesamoidal and spheroidal at first, but became elongated ellipsoid gradually in buffalo foetus as reported by Baishya and Vyas (1991) and Farooqui et al. (2011) in goat foetus. The scrotal testis attained its maximum size, weight and volume at 96 cm CVRL buffalo foetus (Fig. 2). Similarly in goat foetus, there was an increase both in weight and length (CVR) of the developing foetuses as per the advancement of foetal ages (Farooqui et al., 2011).

**REFERENCES**


