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Diagnosis and Surgical Management of Cryptorchidism in Piglets

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ABSTRACT

Four piglets of non-descript breed, weighing 7.2 kg (P1), 7.7 kg (P2), 9.6 kg (P3) and 10.1 kg (P4) were presented with a missing testis. On general examination, only the left testes were found in the scrotum of P1, P2 and P3 while right testis was found in P4. The temperature, pulse and respiration were recorded normal during clinical examination. On manual palpation, the undescended testes could be palpated in inguinal region in P3 and P4 only. However, ultrasonography scanning revealed presence of semi echogenic oval shape image indicative of undescended testis in P1, P3 and P4. Similar structure could not be observed in P2. All the piglets were prepared for castration and cryptorchidectomy operation and both the scrotal and abdominal testis were removed with routine surgical procedure. The abdominal testis in P2 was found absent even after laperotomy operation. It may be a case of congenital anomaly, bearing single testicle which is also known as monorchidism. From the present study, it can be concluded that ultrasonography is the best tool to confirm presence or absence of undescended testis in piglets. Post surgically, the piglets were treated with antibiotics and analgesics parenterally and broad spectrum ointments topically. All the piglet recovered without post-operative complications.

Key words: Cryptorchidectomy, Monorchidism, Piglet, Ultrasonography.

Cryptorchidism is a male anomaly and it is a condition where there is failure of one or both the testes to descend into the scrotum (Amann and Veeramachaneni, 2007). It is commonly seen in all domestic animals but most commonly observed in pigs, dogs and stallions. Cryptorchid testes are smaller and soft to touch with smoother or more pitted surfaces compared to the scrotal testicles (Igbokwe *et al.,* 2009). It can be unilateral or bilateral. In case of unilateral cryptorchidism, only one testis can be palpated in the scrotum. Among the unilateral cryptorchid animals, the right testicle is retained in the abdomen in approximately 80 to 90% of affected animals (Smith *et al.,* 2007). The unilateral cryptorchid males have near to normal fertility due to the production of sperm cell by the already descended testes in the scrotum. But in case of bilateral cryptorchidism, the males are sterile. This sterility is due to both the testes being retained in the abdominal or inguinal region and the temperature of the abdomen being 1-3°C higher than the scrotum for a normal sperm production. Hence, there is occurrence of defective spermatogenesis and this result in sterility. The actual mechanism of abnormal descending of testis is not well defined. But it is said to be a complex process that carried out by various factors include genetic, hormonal, environmental, lifestyle and maternal (Elamo *et al.,* 2022). It is also proposed that inbreeding increases the incidence of cryptorchidism (Ciccarelli *et al.,* 2023). Castration or surgical removal of the testes in pigs is the common practice adopted by the pig rearers as intact male produces androstenone, skatole and indole which greatly contributes to the development of boar taint, an unpleasant odor in pork (Duarte *et al.,* 2021). The pork with boar taint has less market demand due to its unpleasant smell. Therefore, removal of the testes either from the scrotum or from the abdomen in cryptorchid pig is indispensable for improvement of both quality of pork and market demand.

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History and clinical observations

Four piglets of non-descript breed with a body weight of 7.2 kg (P1), 7.7 kg (P2), 9.6 kg (P3) and 10.1 kg (P4) were registered in the year 2025 at the Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Central Agricultural University (Imphal), Jalukie, Nagaland for castration. History revealed presence of no injury or illness of the piglets. The temperature, pulse and respiration were recorded normal during clinical examination.

On physical examination, all the piglets were found to have single descended testis in the scrotum (Fig 1). The right testicle was found to be missing in P1, P2 and P3 whereas left testis was missing in P4. On manual palpation (Fig 2A), the missing testis could be palpated in the inguinal region of piglets P3 and P4 but not in P1 and P2. Finally, ultrasonography was performed with 4 MHz frequency to confirm undescended testis. At first, the scrotal testis was scanned (Fig 2B) in each piglet in order to establish a reference image for comparison. It revealed a semi echogenic oval shaped image. Similar image was observed in the inguinal region of P1, P3 and P4 towards the missing side which was indicative of retained testis (Fig 2C). But there was no symmetrical structure that could be observed in P2. Based on the present findings, the cases were diagnosed as unilateral cryptorchidism. All the piglets were prepared for castration and cryptorchidectomy operation routinely.

Surgical management

Anaesthetic protocol

At the beginning, Meloxicam (MeloneX®, Intas Pharmaceuticals. Ltd.) injection was given intramuscularly @ 0.3 mg/kg body weight in order to relieve pain during operation. Then the piglets were premedicated with Atropine Sulphate (Tropine®, Neon Laboratories Ltd.) @ 0.05 mg/kg body weight intramuscularly. Ten minutes later, anaesthesia was induced by administering Triflupromazine hydrochloride (Siquil, Zenex Animal Health India Pvt. Ltd.) @ 0.8 mg/ kg body weight intravenously.

Surgical procedure

The anaesthetized patient was placed on the operation table with dorsal recumbent and slanting position keeping head down. The lighter piglet was prepared first for castration and cryptorchidectomy operation routinely and aseptically. The right inguinal area was shaved and cleaned with povidone iodine and 2% Lignocaine (Lignovet, Vetmed Biotech) was infiltrated locally at the site of incision. A three centimetre long incision was made on the right inguinal region and blunt dissection was performed to gain access to the abdominal cavity. Further with palpation, the undescended testis was located and exteriorized (Fig 3a). The spermatic cord was then clamped with the help of artery forceps and ligated using chromic catgut (Orion Sutures (India) Pvt. Ltd.) no.1-0. The testis was then removed (Fig 3b) and incision was closed routinely with chromic cat gut size 1 (Fig 3c). Open closed method of castration was performed to remove descended testis. Similar procedure was followed for other piglets too. But the undescended testis could not be found in P2 even after laperotomy operation.

Post operatively, the piglets were treated with Oxytetracycline Hydrochloride injection (Matoxy, Martin and Brown Sciences) @ 10 mg/kg body weight intramuscularly daily for five days, Meloxicam injection (MeloneX, Intas Pharmaceuticals Ltd.) @ 0.3 mg/kg body weight intra-muscularly daily for three days and broad spectrum skin ointment (Himax®, Indian Herbs Specialities Pvt. Ltd.) applied topically twice daily for seven days. After a week, the skin suture was removed and dressing of the wound

Fig 1: Piglets with single descended testicle.

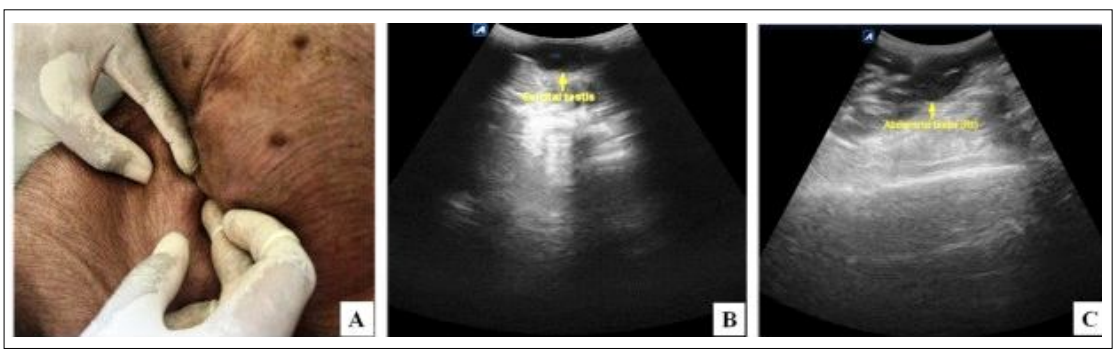

Fig 2: Manual palpation (A) and ultrasonography image of scrotal (B) and abdominal (C) testis.

was done. On day 14th, the piglets were found to be active and recovered uneventfully.

Discussion

Cryptorchidism, a developmental anomaly of the male genitalia, is a congenital condition where one or both testicles and the associated structures fail to descend normally into the scrotum (Zhao *et al.,* 2010 and Rothschild *et al.,* 1988). It harshly impacts on animal welfare and economy of piggery farm. The actual mechanism of cryptorchidism is not well understood but it is proposed to be caused by multiple factor namely genetic, hormonal, environmental, lifestyle and maternal (Elamo *et al.,* 2022). It is also reported that inbreeding potentially increases rate of occurrence of cryptorchidism (Ciccarelli *et al.,* 2023). The present cases were also suspected for inbreeding as the client declared that the boar used for breeding was hired from a common source of the village. A recent study also revealed that a disruption in the normal testicular descent is brought by the suppression of major genes in the motor protein pathway, potentially affect function of the cremaster muscle in testicular descent (Bhaskaran *et al.,* 2025).

Removal of the testis in pigs that is castration, is a common practice adopted among the pig rearers. Castration makes the male pig more docile, faster growth, avoid breeding nuisance and hence, make possible for better management. Besides, castrated pig doesn't produce boar taint, an offensive odour and flavour in the meat. It results from the existence of androstenone and skatole in intact males that reach fatty tissue (Whittington *et al.,* 2002). Pork from uncastrated male pig has less market demand due to the boar taint. Both the scrotal *i.e.* descended and abdominal *i.e.* undescended testes are responsible for ultimate production of the boar taint. The undescended testis in the abdomen not only produces unpleasant boar taint in pork but also interrupts normal spermatogenesis (Gutzwiller and Ampuero, 2013) leads to sterility in bilateral case and produces cryptorchid offspring in unilateral case. Therefore, removal of the testis is important in order to avoid the aforementioned consequences. The elimination of the boar taint and to make the male sterile can be performed through immunocastration and surgical castration. Pig immuno-castration is rare, in contrast to surgical castration. It is carried out by administering a GnRH vaccine (Improvac) that inhibit GnRH activity and progressive regression of testicular function, testosterone production and thereby reduces both the production of germ cell and boar taint (Dunshea *et al.,* 2001 and Batorek-Lukaè *et al.,* 2022). In general, unilateral presence of testis in the scrotum is considered as unilateral cryptorchidism. The abdominal testis can be located through manual palpation (Leslie *et al.,* 2024) in some instance. It is reported that transabdominal ultrasound is the most reliable diagnostic tool to locate undescended testis as the echo structure of the testicle and the mediastinum is well always recognisable for its hyperechogenicity (Carbonari *et al.,* 2022). In the present case, the undescended testis could be located manually in P3 and P4 but ultrasound scanning revealed presence of undescended testis in P1, P3 and P4. Similar findings were obtained during laperotomy operation too. Failure to palpate undescended testis in P1 might be due

Fig 3: Exteriorization (a), removal (b) of abdominal testis and closure (c) of the incision.

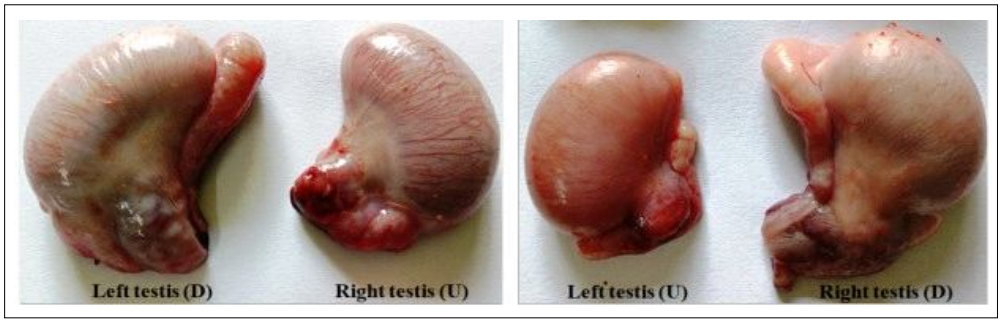

Fig 4: Both side descended (D) and undescended (U) testis.

Table 1: Weight of piglet and their testis.

Piglet	Body weight (kg)	Testicular weight (g)	
		Left testis	Right testis
P1	7.2	7.112 (D)	4.241 (U)
P2	7.7	7.833 (D)	Absent
P3	9.6	9.221 (D)	5.462 (U)
P4	10.1	7.235 (U)	10.956 (D)

D: Descended; U: Undescended.

to smaller in size and frequent fluctuation. On the other hand, the right testis was found to be absent in P2 even after laperotomy operation. The piglet might have born with single testis which is also known as “monorchidism”, a congenital anomaly. The undescended testicles were found to be softer and lighter than the descended one (Fig 4 and Table 1). This finding implies that the undescended testicle is less functional which may be due to compromised physiological condition inside abdomen than the descended one.

It can be drawn from the present study that not all unilateral presence of testis in the scrotum indicates cryptorchidism. Moreover, ultrasonography may be performed prior to undergo cryptorchidectomy to confirm undescended testis or abdominal testis. This will help surgeon to avoid such operation in absence of undescended testis in case of monorchidism. With the present anaesthetic protocol, operation could be performed smoothly and all the piglets recovered uneventfully upon post operative medications.

CONCLUSION

Castration and/or cryptorchidectomy are common approach to make male pig sterile and to remove boar taint. Undescended testis can be located through manual palpation, ultrasonography scanning and laperotomy operation. Among all, ultrasonography is found to be the most effective and accurate tool to diagnose the presence or absence of undescended testis in piglets. It helps to perform cryptorchidectomy operation accurately or to avoid such operation in absence of undescended testis in monorchid animals.

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Conflict of interest

There is no conflict of interest.

REFERENCES

Amann, R.P. and Veeramachaneni, D.N.R. (2007). Cryptorchidism in common eutherian mammals. *Reproduction*. **133:** 541-561.

Batorek-Lukaè, N., Kress, K., Èandek Potokar, M., Fazarinc, G., Škrlep, M. Poklukar, K., Wesoly, R., Stefanski, V. and Vrecl, M. (2022). Immunocastration in adult boars as a model for late onset hypogonadism. *Andrology*. **10(6):** 1217-1232. doi: 10.1111/andr.13219.

Bhaskaran, B.C., Meyermans, R., Gorssen, W., Bogaert, K.V., Wenger, J.B., Maes, G.E., Buyse, J., Janssens, S. and Buys, N. (2025). Genome-wide transcriptome analysis reveals differentially expressed genes and key signalling pathways associated with cryptorchidism in pigs. *Scientific Reports*. **15:** 6307. https://doi.org/10.1038/s41598-025-90471-9.

Carbonari, A., Lillo, E., Cicirelli, V., Sciorsci, R.L. and Rizzo, A. (2022). The use of abdominal ultrasound to improve the crypto-rchidectomy of pigs. *Animals*. **12(14):** 1763. https://doi.org/10.3390/ani12141763.

Ciccarelli, M., Catone, G. and Vullo, C. (2023). Common swine field reproductive surgeries. *Clinical Theriogenology*. **15:** 87-97. https://doi.org/10.58292/ct.v15.9645.

Duarte, D.A.S., Schroyen, M., Mota, R.R., Vanderick, S. and Gengler, N. (2021). Recent genetic advances on boar taint reduction as an alternative to castration: A review. *Journal of Applied Genetics*. **62(1):** 137-150. doi: 10.1007/s13353-020-00598-w.

Dunshea, F.R., Colantoni, C., Howard, K., McCauley, I., Jackson, P., Long, K.A., Lopaticki, S., Nugent, E.A., Simons, J.A., Walker, J. and Hennessy D.P. (2001). Vaccination of boars with a GnRH vaccine (Improvac) eliminates boar taint and increases growth performance. *Journal of Animal Science*. **79(10):** 2524-2535. doi: 10.2527/2001.79102524x.

Elamo, H.P., Virtanen, H.E. and Toppari, J. (2022). Genetics of cryptorchidism and testicular regression. *Best Practice and Research Clinical Endocrinology and Metabolism*. **36(1):** 101619. https://doi.org/10.1016/j.beem.2022.101619.

Gutzwiller, A. and Ampuero, K.S. (2013). Suppression of boar taint in cryptorchid pigs using a vaccine against the gonadotropin-releasing hormone. *Schweizer Archiv für Tierheilkunde*. **155:** 677-680.

Igbokwe, I.O., Grema, H.A. Ikpo, A.E. Mshelbwala, F.M. and Igbokwe, N.A. (2009). Unilateral cryptochidism in Nigerian sahel Bucks. *International Journal of Morphology*. **27(3):** 805-810.

Leslie, S.W., Sajjad, H. And Villanueva, C.A. (2024). Cryptorchidism. [Updated 2024 May 5]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470270/

Rothschild, M.F., Christian, L.L. and Blanchard, W. (1988). Evidence for multigene control of cryptorchidism in swine. *Journal of Heredity.* **79:** 313-314.

Smith, K.C., Brown, P.J. Morris, J. and Parkinson. T.J. (2007). Cryptorchidism in North Ronaldsay sheep. *Veterinary Record.* **161:** 658-659.

Whittington, F.M., Doran, E., McGivan, J.D. and Wood, J.D. (2002). Relationships between skatole and androstenone in large white and meishan pigs. *Proceedings of the British Society of Animal Science.* pp: 186-186.

Zhao, X., Du, Z.Q. and Rothschild, M.F. (2010). An association study of 20 candidate genes with cryptorchidism in siberian Husky dogs. *Journal of Animal Breeding and Genetics.* **127:** 327-331.