Pelvic Fracture, Coxo-femoral Luxation in a Pregnant Nigerian Local Bitch Following Road Traffic Accident

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ABSTRACT
A road traffic accident is a life-threatening traumatic condition affecting man and animals. A 7-Year-old local bitch weighing 25 kg was presented to the Veterinary Teaching Hospital (VTH), Usmanu Danfodiyo University, Sokoto with the chief complaint of trauma following an automobile accident. At presentation, vital parameters were within normal range but the dog was on sternal recumbency. During clinical examination, there was an audible crepitating sound on rectal palpation. The mammary glands were engorged and ultrasonography revealed pregnancy with presence of viable foetuses. Dorsoventral radiography of the pelvic region revealed fracture of the pelvis and right coxo-femoral luxation. However, the bitch died over-night and was sent for post mortem, which revealed fracture of the right ilium and pubis with severe intra-muscular haemorrhages of the gluteus and quadriceps muscles. There was diaphragmatic hernia along with congested lungs and blood-tinged fluid in the thorax. There was also severe hydroperitoneum, rupture of the left uterine horn and six dead foetuses in-utero. The dog may have died of hypovolemic shock due to the traumatic injury.

Keyword: Bitch, Coxo-femoral luxation, Pelvic Fracture; Pregnancy; Road traffic accident

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INTRODUCTION
Fracture is a break in the continuity of a bone due to excessive force, stress, or trivial injury such as in pathologic fractures [1]. Pelvic fracture is a common occurrence in small animals following road traffic accidents (RTA), and accounts for 25% to 27% of all fractures in veterinary practice [2, 3, 4]. Most small dogs with type II pelvic fractures recover without surgery although, surgery within 72 hours is required if the fracture is unstable [5]. Pelvic fracture in pregnant animals could be life threatening to both the dam and the unborn neonate, due to possible rupture of gravid uterus and the resulting hypovolaemia.

Pregnancy is a complex process that begins at conception following fertilization of the ova by the spermatozoa, and extends to the second stage of parturition [6]. In the bitch, this process last for 56 to 68 days, with an average of 64 days [7]. It is a delicate state in which the bitch and the growing pup require adequate care to survive. Healed unstable fracture of the pelvic bone has been implicated as a cause of obstructive dystocia in the bitch due to narrowing of the pelvic canal [8]. This paper reports a case of pelvic fracture in a pregnant bitch following an automobile accident, and the resultant complications.

CASE PRESENTATION

Case History
A 7-Year-old Nigerian local bitch weighing 25 kg was presented to the Small Animal Clinic unit of the Veterinary Teaching Hospital (VTH), Usmanu Danfodiyo University, Sokoto with the chief complaint of trauma following an automobile accident. The dog was first presented to the Aliyu Jodi Veterinary Centre (a local veterinary clinic), before being referred to the VTH. History revealed that the bitch fed on table remnants and had no history of previous medication or vaccination.

Clinical Examination and Investigations
The rectal temperature, pulse and respiratory rates were 37.3°C, 96 beats/minute and 32 cycles/minute, respectively. The bitch had a pinkish ocular mucous membrane, and appeared alert but on sternal recumbency. Rectal palpation using the index finger revealed a crepitating sound on manipulation of the pelvis. The mammary glands were engorged and upon gentle abdominal palpation, hard masses were felt in the abdomen, suspected to be foetuses.

The plan of action was to take a radiograph of the pelvic area and an ultrasonography for foetal viability. There was difficulty in adequate positioning the bitch for radiograph due to the pain experienced by the bitch. However, ultrasonography was successfully carried out using a B-mode real time ultrasound scanner with a convex probe (Model RMS Vet image 201-China). A liberal ventral abdominal area was shaved and the bitch placed on left lateral recumbency with the right limb gently raised. Acoustic gel was applied on the convex transcutaneous probe (3.5 MHz) and placed on the prepared site to view the uterus. Three gestational sacs were captured and foetal motility observed (Figure 1).

A dorsoventral radiograph of the pelvic region revealed pelvic fracture involving the ilium and the ischium, and right coxo-femoral luxation (Figure 2). It was decided that management of the fractured pelvic will be differed pending the delivery of the bitch. However, the pelvic fracture could be a hindrance to per vagina delivery. Elective caesarean section was therefore recommended. However, the bitch was stabilized by immobilizing the pelvic region. However, the bitch was found dead the following morning.

Post mortem examination revealed about 2-3 litres of blood-tinged hydrothorax. The lungs were congested and there was a ventral diaphragmatic hernia. There was severe hydroperitoneum, rupture of the left uterine horn with the peritoneum overlying the uterus intact and six dead foetuses in-utero (Figure 3). The right ilium and ischium were fractured with severe intra-muscular haemorrhages.

DISCUSSION
The pelvic bones are extremely important for parturition in mammals. A fracture of the pelvis during pregnancy is often associated with high foetal and maternal mortality rates.
[9], although, early diagnosis and evaluation may reduce mortality. In this current case, the inability of the bitch to rise from sternal recumbency at presentation was indicative of Type I or II pelvic fracture. During clinical examination, there was audible crepitating sound of the pelvis suggestive of unstable pelvic fracture (Type I or II pelvic fracture). This was confirmed by radiography of the pelvic area, which revealed fracture of the ilium, ischium and type I or II pelvic fracture. It also revealed right coxo-femoral luxation. This is capable of causing dystocia due to pain associated with contractions during parturition. The pain will be initiated by frictional force produced by the bone fragments at each bouts of contraction. In addition, unstable pelvic fracture is capable of narrowing the pelvic height and width, resulting in dystocia due to relative foetal oversize [8].

In this case, ultrasonography was employed to confirm pregnancy in the bitch and determine the viability of the foetuses. It can also provide information on gestational age, which enables the clinician predict whelping time [10]. Gestational age could not be estimated in this case due to the limitation of the ultrasound used. Information on the gestational age would have assisted in deciding the proper time for elective Caesarean section, probably saving the dam and the neonates. Ultrasonography is a simple, reliable, inexpensive and non-invasive imaging technique that diagnoses pregnancy in the bitch as early as 18 days after ovulation, foetal movements at 28 days and heartbeat at 35 days post breeding [11].

The post mortem findings suggested the bitch might have died of hypovolemia and or severe septicaemia due to the traumatic injury following the automobile accident. The impact of the trauma caused the rupture of the diaphragmatic wall and fracture of the pelvic bones. The ruptured diaphragm led to the blood-tinged hydrothorax cavity and compromised the lungs resulting in the congestion observed at necropsy. Fragments from the pelvic fracture may have pierced the gravid uterus and the trauma to the hindquarters caused the haemorrhage of the glutal and quadriceps muscles. Abdominal and uterine contractions along with the initial piercing of the uterine wall by the bony fragment may have led to the rupture of the uterine wall and subsequent death of the foetuses. These cascade of events and the resulting effects of hypovolaemia probably led to the death of the bitch.

Conclusion
Traumatic injury from RTA is an emergency medicine that requires prompt and urgent attention, as well as diagnostic tools that will aid diagnosis and management. The bitch may have died of severe blood and fluid loss due to the traumatic injury following RTA. Its reproductive status may have complicated the case coupled with lack of adequate diagnostic equipment.

Conflict of interest
The authors declare that they do not have any conflict of interest.

Acknowledgment
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REFERENCES


*Figure 1*: Ultrasonograph of the uterus of a pregnant Nigerian bitch showing three gestational sacs suggestive of foetuses (arrows)
Figure 2: Dorsoventral radiograph of the pelvic region showing fracture of the ilium, ischium (vertical arrows) and right coxo-femoral luxation (horizontal arrow) of a bitch. Note: The point of detachment of the ischium from the pubis (diagonal arrow).

Figure 3: Picture showing five out of six dead foetuses found in the uterus of a bitch at post mortem following road traffic accident.