

Dystocia Due to Fetal Ascites in a Graded Murrah Buffalo and Its Obstetrical Management

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ABSTRACT

Fetal ascites, an accumulation of free fluid in the abdomen of the unborn calf, is a rare reason for a calving to fail, and what is written about it in buffaloes is mostly anecdotal. This narrative review gathers published literature on dystocia in cattle and buffaloes, on the fetal and placental disorders that can enlarge or distort a fetus, and on the obstetric options usually discussed when a fetus cannot pass the birth canal: manipulation and traction, reduction of fetal bulk, and caesarean section. No individual case is presented here, and none is described or implied; the article is a synthesis of what others have reported. Large cohort work on cattle shows that fetal size relative to the maternal pelvis is a central driver of difficult birth, and reviews of buffalo reproduction supply the species context, but evidence specific to fluid-distended fetuses rests almost entirely on single case reports, which are vulnerable to selective reporting and rarely state outcomes beyond the day of delivery. Choice among obstetric options therefore remains case dependent and turns on fetal viability, the degree of disproportion, the condition of the dam, the facilities at hand and the operator's skill. The review closes with the points a useful report or registry should record, and with a plea for comparable, openly stated outcomes.

Keywords: Dystocia; Fetal ascites; Murrah buffalo; Caesarean section; Obstetrics; Fetal abnormality; Narrative review

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1. Introduction

A calving that does not go to plan is among the more stressful events in dairy and draught-animal husbandry. The dam is in pain, the calf is running out of time, and the person standing in the shed has to decide quickly whether to pull, cut, operate or wait. Dystocia, the term for difficult or obstructed birth, is a well-studied problem in cattle, where it is linked to calf losses, to illness in the dam and to poorer later performance [1, 2, 3]. In buffaloes the literature is thinner, although the animals are central to milk production and rural

livelihoods across South Asia and beyond [4].

Among the fetal reasons for obstructed delivery, one of the less common is fetal ascites, an accumulation of free fluid in the abdominal cavity of the unborn calf. A fluid-distended abdomen makes the fetus too bulky to pass the pelvis even when its posture is perfectly normal, and the delivery fails for reasons that no amount of correction of limbs or head can fix. Standard obstetric texts and a scatter of published reports describe the problem and the ways it has been managed, which is why the title of this article

names it together with a graded Murrah buffalo, an animal type produced by upgrading local stock with Murrah breeding.

We want to be plain about what this article is. It is a narrative review of published literature, and it does not present, describe or imply an individual clinical case. No animal, owner, farm or treatment record is reported, and the reader should not look for one. The title refers to a clinical situation that others have written about, and the pages that follow try to say what those reports, together with the wider literature on bovine and buffalo dystocia, can and cannot tell a practitioner. The aim is a fair account of what is known and what is merely repeated.

Three questions guide the review. What makes a fetus too large or too distorted to be born, and where does fetal ascites sit among those causes? What obstetric options are described for such a fetus, and on what grounds are they chosen? And how strong is the evidence behind those choices, especially for buffaloes? We do not give step-by-step procedures or drug doses. Those belong in surgical texts and in the hands of a trained veterinarian, and a summary like this one could not do them justice.

2. Literature Review

2.1 Dystocia in Cattle

The best-developed literature concerns dairy cattle. Reviews of prevalence and risk factors show that difficult birth is shaped by a mixture of calf, dam and management factors, and that its frequency depends heavily on how it is defined and scored [1, 5, 6]. Calf size relative to the dam is a recurring theme: heavier calves are more often associated with assisted or difficult calvings, and birth weight predicts calving ease and early calf death [7]. The condition of the dam also plays a part, with body condition at calving linked to the risk of dystocia and stillbirth [8].

The consequences are well documented. Calves born after a difficult delivery are more likely to be weak, to be sick and to die in early life [2, 9], and the dam may suffer lower production, poorer fertility and a higher risk of loss from the herd [3]. Stillbirth itself has effects on the dam that reach beyond the day of calving [10]. These findings come mostly from intensive dairy herds with good records, and we should be careful about assuming that every number and every association carries over to a smallholder buffalo.

Management around calving is partly in the farmer's hands. Work on modifiable risk factors

suggests that supervision, timely and appropriate assistance, and attention to the newborn can reduce perinatal losses [11, 12], and a broader discussion of why so many calves die on modern farms stresses the importance of welfare and good practice at birth [13]. Newborn calf vitality, how alert and capable the calf is in its first minutes, has also been proposed as a measurable link between the birth itself and what follows [14]. This is why the same condition can read as straightforward in one account and baffling in the next.

Definitions deserve a word. Studies of dystocia use different scoring scales, different thresholds for what counts as assistance, and different populations, so that figures from one herd cannot be set beside those of another without care [1, 6]. Genetic evaluation of calving ease has been a major focus in dairy breeding, and the distinction between direct effects of the calf and maternal effects of the dam is a reminder that the same difficult delivery can have more than one origin [5, 7]. None of this was designed with the buffalo in mind.

2.2 Fetal and Placental Contributors

Dystocia is conventionally divided into maternal and fetal causes, and fetal causes include oversize, abnormal posture or position, and malformation [5, 15]. Oversize does not always mean a heavy but otherwise normal calf. A fetus can be enlarged by fluid, by a swollen abdomen or thorax, or by a distended head or limbs, and a reduction in the number of problems that can be solved by traction is the practical result. Table 1 groups the main contributors discussed in the literature.

Fluid and placental disorders deserve a closer look. The ruminant placenta is a complex organ whose development and function underpin fetal growth [16], and its disorders, before and after birth, are described in the veterinary pathology literature [17]. In cattle, abnormal accumulation of fluid in the fetal membranes or fetus has been discussed in connection with errors in the development of fetuses and placentas, notably after assisted reproduction techniques [18]. That link does not mean every fluid-filled fetus has the same origin, and we return to the problem of cause below. Two broad possibilities are usually kept in mind: that the fluid reflects a primary problem in the fetus itself, or that it reflects a disturbance of the placenta and its fluid balance. Distinguishing them takes post-delivery examination of both fetus and membranes, and the published accounts only occasionally say that it was done.

Table 1. Groups of fetal and maternal contributors to dystocia in cattle and buffaloes.

Group	Examples	Why it matters
Fetal size	Large calf, male calf, long gestation [6, 7]	Raises the chance of disproportion with the pelvis
Fluid accumulation	Fetal ascites, hydrops of the fetal membranes, swollen fetus	Adds bulk without adding a deliverable shape [17, 18]
Malformation	Skeletal, vertebral or visceral anomalies [20]	Distorts shape; may fix limbs or trunk
Posture and position	Limb or head deviation, breech	Usually correctable if the fetus is of normal size
Maternal factors	Young or small dam, poor condition, weak labour [1, 8]	Narrow canal or inadequate effort
Infection and loss	Congenital infection, fetal death [22, 23]	Fetus may be abnormal, dead or both

Note: Qualitative grouping drawn from the cited reviews; no frequencies are given because they differ by population and by how dystocia is defined.

Fetal death changes the problem. A fetus that dies before or during labour may be swollen with gas or fluid, may no longer contribute to its own delivery, and may be harder to manipulate because its tissues are fragile. For that reason the viability of the fetus is usually the first matter settled in any account of obstetric choice, and the effect of its answer runs through every later decision [12, 15].

2.3 Fetal Ascites and Related Abnormalities

Fetal ascites is better understood as a sign than as a diagnosis. Accounts in obstetric texts connect it with a range of fetal problems, including disorders of the urinary tract, liver, heart or lymphatic system, and with infection, though in many individual reports no underlying cause is established. Human medicine offers a useful parallel: the literature on non-immune hydrops fetalis lists a long catalogue of causes and acknowledges that a proportion of cases are never explained [19]. Veterinary reports rarely have the investigative resources that make such classification possible.

Inherited malformations show how a structural abnormality can be pinned down when the effort is made. Complex vertebral malformation in Holstein calves was characterised by pathology and later by genetic testing [20]. The lesson for fetal ascites is partly encouraging and partly sobering. Causes can be found, but only through necropsy, imaging or molecular work that most field cases never receive. Where related animals are mated, recessive abnormalities become more likely to appear [21], and in a graded population with

sparse pedigree records that possibility is hard to examine.

Infection is another candidate. Reviews of infectious causes of bovine abortion in mid and late gestation list agents that can damage the fetus [22], and viral infection of the fetus, notably with bovine viral diarrhoea virus, can cause congenital defects [23]. Whether any of these agents lies behind a given case of fetal ascites in a buffalo is generally not known, because testing is rarely done and, even when it is, the findings are seldom reported.

Recognition in the field is typically by the attending veterinarian's examination, which finds a fetus that is larger or more distended than its posture would suggest and that does not advance despite correct presentation. Imaging is available in some practices and referral centres, and where it is used it can help to distinguish fluid from solid bulk, but the reports available to us seldom say whether it was used. We do not describe examination technique here, because it is learned by supervised practice and not from a review [12, 24].

2.4 Buffaloes: Species Context

Buffaloes are not simply cattle with darker coats. Reviews of their reproduction describe differences in cycle length, in expression of oestrus and in seasonal patterns of breeding that shape when and how calvings occur [25, 26], and more recent syntheses summarise advances in buffalo reproduction while pointing out how much remains to be learned [27]. The river buffalo also suffers embryonic and fetal losses whose causes are still being clarified [28].

Reviews of fetal dystocia in cattle and buffalo bring the two species together and note where the buffalo literature depends on extrapolation from cattle [15]. The Murrah is a dairy breed of north-western India that has been widely used to upgrade local animals, and a graded animal may differ in size and conformation from both the pure breed and the stock it was graded from [4]. Pelvic dimensions, calf size and the pattern of breeding in such animals are rarely recorded in a form that can be compared across studies.

Management systems matter too. Many buffaloes are kept in small herds where calving is attended by the household, veterinary help may be hours away, and the decision to call for it is influenced by cost and by what the household believes is possible. Late presentation is therefore a feature of the setting and not a failing of the owner, and reports from referral hospitals describe the

animals that arrive, which may not be representative of all that calve [4, 13].

2.5 Obstetric Options

When a fetus cannot be delivered through the natural passages, the literature describes a graded set of options. Manipulation and traction suit a fetus of manageable size whose posture is the problem. Where the fetus is dead, or cannot survive, or is clearly too bulky, reduction of fetal bulk through the natural passages is described. Caesarean section is the main alternative when the disproportion is marked or the calf is alive and worth saving [24, 29]. Table 2 sets these options side by side as a matter of orientation only.

Caesarean section in cattle has been described in detail, and surveys of practice show how much of the operation is shaped by habit, facilities and operator preference [24, 29]. This is not a criticism. Practitioners adapt to what they have. It does mean that when a report says an operation was done, the reader learns little about why that operation, rather than another, was selected unless the reasoning is spelled out.

Table 2. Obstetric options for an oversize or distorted fetus: where each fits and what to weigh.

Option	Usually considered when	Main concerns
Manipulation and traction	Fetus is of normal size but badly postured [12]	Little room to work if the fetus is oversize; risk of trauma to the dam
Reducing fetal bulk	Fetus is dead or cannot survive, and the canal is passable	Skill, instruments and hygiene; injury to the dam if done poorly
Caesarean section	Disproportion is marked or the fetus is alive and worth saving [24, 29]	Surgical and anaesthetic risk; later fertility and herd cost
Euthanasia of the dam	Condition poor and no practical option remains	Welfare, economics and owner wishes
Referral	Time and distance allow; a better-equipped facility exists	Delay itself can harm the dam and calf [2, 13]

Note: Qualitative comparison for orientation only; it describes considerations, not a procedure, and the choice rests with the attending veterinarian.

Timing and referral are part of the same discussion. A delay before help is sought can reduce what can be done and raise what can go wrong, and the literature on calf survival repeatedly stresses early and appropriate assistance [2, 11]. Where the dam is exhausted, injured or in poor condition, the realistic options narrow, and in some situations humane

destruction of the dam is a legitimate outcome that a candid account would name. It is rarely named in published reports.

2.6 After the Delivery

A delivery, however it is accomplished, is the start of a recovery, not the end of a case. Uterine disease after calving is common enough to have its own definitions and a large literature [30, 31], and risk factors for it include several that cluster around difficult calvings [32]. A dam that has had a hard birth, an operation or both therefore needs observation for infection, retained fetal membranes, injury and failure to return to feed.

Pain is part of that picture. Surveys of cattle practitioners reveal wide variation in attitudes to pain and in the use of analgesia [33], and for obstetric interventions this variation has welfare consequences that reports seldom mention. The calf, if alive, also needs attention, and assessment of its vitality in the first hours provides a basis for further care [14]. Time matters, but so does not rushing into the wrong operation.

3. Materials and Methods

3.1 Scope and Question

The review asks a single question in three parts: what is known about fetal ascites as a cause of dystocia in cattle and buffaloes; what obstetric options are reported for a fluid-distended or otherwise oversize fetus and how they are chosen; and how reliable the supporting evidence is. We divided the question into smaller ones that any report would have to answer, such as how the cause was established, how the decision was reached, how the dam and calf fared, and how long they were followed. None of these steps is difficult, but each one is easy to skip.

3.2 Literature Assembly

The review draws on published work in four areas: dystocia and calving in cattle; reproduction and calving in buffaloes; fetal, placental and congenital disorders; and the methodology of case reports and narrative reviews. Sources were chosen for relevance, standing in the field and clarity of method. Work on other species and on human medicine is used to illustrate general points and is not offered as evidence of what happens in buffaloes.

We did not run a formal systematic search and we do not claim one. This is a narrative synthesis, and the choice of sources reflects the authors' judgement, a feature of the narrative form that has both defenders and critics [34, 35, 36]. In practice, the review is a better guide to what a good report

should contain than to the frequency or outcome of any procedure, and it avoids quoting figures from individual reports that could not be checked against the primary papers for this article.

3.3 Appraisal Framework

To judge how far a report can be relied upon, we used a short set of questions adapted from published thinking on case reports [37, 38]. Is the cause of the fluid accumulation established, and by what means? Are the reasons for the chosen option stated? Are the outcomes for both dam and calf described beyond the day of delivery? And does the report say what was uncertain? Case reports have a recognised value in drawing attention to rare conditions [39], and a recognised weakness in what they can prove [40]. Table 3 lists the limitations we looked for.

4. Results

4.1 What the Literature Says About Cause

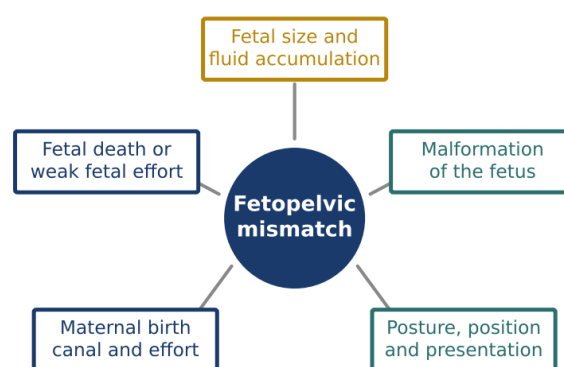
The literature treats fetal ascites as one among several fetal reasons for obstructed delivery, with fetal size and malformation the most thoroughly discussed [5, 15]. Fluid within the fetal abdomen adds bulk without adding a shape that the maternal pelvis can accommodate, so that the problem is one of disproportion, not of posture (Figure 1). In cattle the larger framework of calf size, dam size and gestation length is well researched [6, 7], whereas the contribution of fluid accumulation is mostly described in case-level terms.

Table 3. Why the case-report evidence on fetal ascites is hard to use.

Limitation	Consequence	What would help
Single animal	No comparison group; cannot judge cause and effect [38, 40]	Pooled series with common definitions
Selective reporting	Unusual or successful cases are published [41, 42]	Registries; reports of failures
Short follow-up	Fertility and later health unknown [3, 30]	Follow-up through next calving
Cause often unconfirmed	Anomaly, infection, idiopathic cannot be separated [20, 23]	Necropsy or imaging findings reported
Unstated decision rules	Reader cannot tell why one option was chosen	Report the reasoning [37]
Buffalo data thin	Cattle findings borrowed without checking [25, 27]	Species-specific series

Note: Limitations follow the cited methodological literature on case reports; they are not attributed to any particular report.

Reports on the cause of fluid accumulation fall into two groups. In some, an anomaly is identified, often through examination of the fetus after delivery. In others the finding is described as idiopathic, which means that the cause was not found. The second group is probably larger, because the means of looking are rarely available in the field, and because a report whose cause is unknown is harder to publish as a clinical lesson than one that has a tidy explanation. This is why the same condition can read as straightforward in one account and baffling in the next.



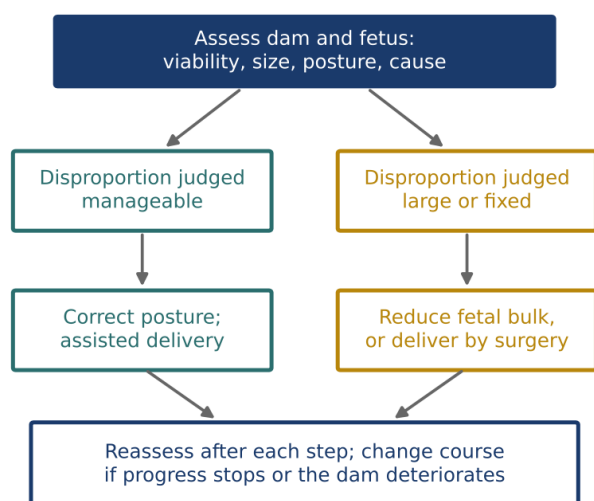
Schematic of contributing groups, not data

Figure 1. Groups of contributors to fetopelvic mismatch (schematic, not data).

4.2 What Is Reported About Management

Where fetal ascites is reported, the described management follows the same logic as other forms of fetal oversize. If the fetus is dead or cannot survive and the passages allow it, reduction of fetal bulk is discussed as a way to deliver without surgery. If the fetus is alive, or the passages do not allow reduction, caesarean section is the usual alternative [24, 29]. In each situation the choice is framed by the operator's skill, the facilities available and the dam's condition (Figure 2). The figure is a way of organising the reasoning, and the reports themselves rarely lay it out so tidily.

What is notable is how much is left unsaid. Few reports state the reasoning behind the selected option, the time between the start of difficulty and intervention, or the state of the dam at the start of the operation. Yet the interval between onset and assistance is among the factors that influence how calf and dam fare [2, 11]. Without such information a later reader has little to weigh. A well-kept timeline, even a rough one, would be worth more to the next practitioner than a long account of the operation itself. A decision made at two in the morning, a long way from help, is not the decision a textbook describes.



Conceptual flow, not a protocol or a recommendation

Figure 2. Conceptual flow of obstetric reasoning for an oversize fetus (not a protocol).

4.3 Outcomes of Dam and Calf

Outcomes are the weakest part of the literature. In cattle generally, the consequences of dystocia for calf survival and for the dam's later performance are clear [2, 3, 10]. For fetal ascites in buffaloes the picture comes from single reports that usually record the immediate result and say little about what followed. A calf with fluid in its abdomen is often delivered dead or dies soon afterwards, and when it is alive the underlying abnormality may limit its prospects; but this is a reading of the general fetal literature and not a finding we can attach to buffalo outcomes.

For the dam, the question is whether she returned to normal. Postpartum uterine disease and its effect on herd reproductive performance are well described in cattle [30, 31, 32], and an operation adds its own risks. Follow-up through the next breeding and calving is the information that would tell us whether a given choice protected the animal's future, and it is the information most often missing. The silence of the record on this point should not be mistaken for success. Read this way, silence in the literature about poor outcomes is not evidence that there were none.

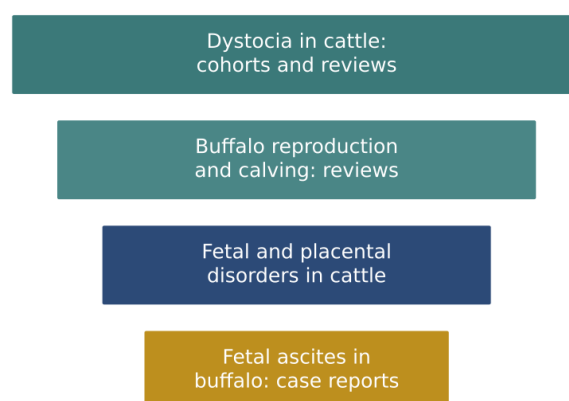
Economic consequences are rarely reported at all. Cattle studies place a cost on difficult calving in terms of lost milk, reduced fertility and replacement [3, 10], and a similar reckoning for buffaloes would have to add the value of the calf, the cost of veterinary attendance and the time the dam is out of production. For a smallholder these items can decide whether surgery is affordable, and a review that ignored them would be

describing an idealised practice.

4.4 Quality of the Evidence

The appraisal questions reveal consistent weaknesses (Table 3). Each report concerns one animal, with no comparison, so that the reader cannot separate the effect of the chosen option from the course the case would have taken anyway [38, 40]. Reports that reach print tend to be those with something unusual to teach or a good result to show, and a literature built that way systematically under-represents failure [41, 42].

These problems are not peculiar to veterinary obstetrics. Small studies in every field give unstable results and are easily over-read [43, 44], and a single case is the smallest study there is. The CARE guidelines for case reports were written to improve exactly this situation by asking authors to state timelines, reasoning, outcomes and follow-up in a consistent way [37]. Few of the veterinary reports we know of follow them. The point is not that a report is poor, only that its message travels less far than its title suggests.



Schematic of evidence depth; widths are not counts

Figure 3. Schematic of evidence depth for the questions in this review; widths are not counts.

Evidence for the wider question of dystocia is much deeper than evidence for fetal ascites in buffaloes, as Figure 3 sketches. Large cattle datasets support firm statements about calf size, dam condition and consequences [1, 7, 8]. Buffalo reviews support statements about species biology [25, 27]. For fluid-distended fetuses in buffaloes, the base is a handful of case descriptions, and conclusions must be cautious accordingly.

4.5 Reading a Report

A practitioner reading a report of this kind can usefully ask a short sequence of questions. How was the diagnosis made, and was the cause of the fluid sought? On what grounds was one option

chosen over the others, and what were the alternatives given the facilities? What happened to the dam over the following weeks and at her next calving? And what would the authors do differently? A report that answers all four is rare, and one that answers none should be read as an observation, not as guidance.

Context matters as well. An approach that is reasonable in a referral hospital with surgical staff and anaesthesia may be impractical on a smallholding, and the reverse can also be true: a field decision to avoid surgery may be the sound one when the dam is weak and help is far away. Reports seldom distinguish between what was best in principle and what was possible on the day [12, 29].

There is a further reason for caution about how such reports are read. A clinician who has seen one fluid-distended fetus delivered by one route may reasonably remember the case as a template, and may pass it on to colleagues as a rule of thumb. Yet a template drawn from one animal carries all the accidents of that animal, its size, its dam, the hour and the helpers, and none of the evidence needed to tell which of them mattered [39, 43].

5. Discussion

5.1 Interpretation

The main finding of this review is a conditional one. Fetal ascites is a rare, case-dependent cause of dystocia that behaves, for obstetric purposes, like any other cause of fetal oversize: it creates a mismatch between fetus and pelvis that correction of posture cannot resolve. How that mismatch is handled depends on whether the fetus is alive, how large the disproportion is, how the dam is faring, and what the attending veterinarian can offer [15, 24]. No source we found offers a rule that works in every situation, and we would distrust any that claimed to. Nothing in this reading argues against intervening; it argues for recording what happens afterwards.

The second conditional concerns how much the evidence can bear. The case-report literature is useful for naming the problem and for showing what has been tried, but it cannot tell us how often one option does better than another [39, 40]. Decisions at the bedside will therefore continue to draw on general obstetric principles learned in cattle, on the clinician's experience, and on the particulars of the animal, and that is a reasonable way to work as long as the limits of the underlying evidence are acknowledged.

A third point concerns the dam. Because reports concentrate on the day of delivery, the long-term costs of difficult births are underestimated. Cattle data show that these costs include lost production, impaired fertility and removal from the herd [3], and uterine disease is a frequent sequel [31, 32]. For a household that depends on a single buffalo, the loss of a future lactation may matter more than the loss of one calf. These points apply with equal force to any rare obstetric condition, not only to fetal ascites.

5.2 Limitations

This is a narrative review and shares the limitations of that form. The selection of sources reflects judgement, no formal search or quality scoring was done, and the review does not quote numerical results from individual reports because these could not be checked against the primary papers for this article. A reader who needs a particular figure should consult the original reports, applying the appraisal questions above, or wait for a formal systematic review, which methods exist to support [35, 36].

The review also draws on evidence from dairy cattle and from other fields, which are imperfect proxies for buffaloes. Cattle studies describe herds with different management, recording and breeding, and the human hydrops literature describes a different species altogether [19]. We have used such sources to frame questions and to show what good evidence looks like, and the conclusions should be read in that light. Reviews of this kind are more useful when they say where the evidence stops than when they smooth it over.

5.3 Implications for Reporting

A report that would be useful to others would describe the animal and its breeding in plain terms, state how long labour had gone on and what had been done before help arrived, and say how the fetus was examined and whether the cause of the fluid was sought by necropsy, imaging or laboratory work [37]. It would give the reasoning behind the chosen option and the alternatives that were considered, record who did what and with what facilities, and name complications as readily as successes.

It would also follow the dam beyond the day of delivery, through recovery, rebreeding and the next calving where possible, and would record how pain and welfare were handled [33]. Reports that include these items are more demanding to write, but they are the ones from which other practitioners can learn. Journals and editors can help by accepting reports of poor outcomes as

readily as good ones, which would at least begin to correct the bias in what reaches print [41].

5.4 Directions for Future Work

Three needs stand out. First, a formal systematic review of fetal causes of dystocia in cattle and buffaloes with a transparent search and appraisal. Second, a shared registry, however simple, in which practitioners record difficult calvings in buffaloes with the same few items, so that patterns can emerge that single reports cannot show. Third, more investigation of cause: where fluid-distended fetuses are delivered, simple and consistent examination of the fetus and, where possible, of the placenta [17, 23] would turn anecdote into evidence.

Buffalo-specific reference data on pelvic dimensions, calf size and calving behaviour would also help, because the practice of reading buffalo problems through cattle numbers is common and rarely tested [26, 28]. Even modest datasets of this kind would improve the quality of discussion, and they would give future reviewers something firmer to synthesise.

5.5 Practical Reading for Veterinarians and Keepers

For a veterinarian, the sensible position is to treat fetal ascites as a problem of fetal bulk, to settle viability early, to weigh the dam's condition against what the facility can offer, and to avoid being drawn into a fixed sequence of steps just because it is customary [24, 29]. A decision to change course when progress stops is a sign of judgement, not of failure, and the record should say so.

For a keeper, the practical point is early help. A calving that does not progress is a reason to call, not to wait, and the evidence on calf survival after difficult births supports prompt attention [2, 11]. Keepers can also help science by allowing the fetus to be examined after delivery and by remembering what happened to the dam, because those two pieces of information are the ones the literature most lacks.

6. Conclusion

Fetal ascites is a rare cause of obstructed birth. Where it occurs, the fetus is too bulky to pass the maternal pelvis, and the available options are those that apply to any oversize fetus: assisted delivery if size allows, reduction of fetal bulk, or surgical delivery. This review found that the evidence for choosing among them in buffaloes rests on case reports, which are anecdotal, vulnerable to selective publication and silent about

what happens after the day of delivery. The decision remains case dependent, and it is best made by a trained veterinarian who knows the animal and the facilities at hand.

For practitioners the message is practical rather than discouraging. Record what you see, say why you chose what you chose, and follow the animal afterwards. For researchers and editors, the opportunity is a set of comparable, openly reported cases and a register that makes rare events visible. The article presents no case of its own, and its worth lies in clarifying what a good report would contain and where the evidence stops.

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9. Conflict of Interest

The authors declare no conflict of interest.

10. Author Contributions

F.L. conceived the review and wrote the sections on dystocia and buffalo reproduction. A.L. wrote the sections on obstetric and surgical options. E.D. wrote the sections on evidence appraisal and reporting. All authors revised the manuscript and approved the final version.

11. Ethics Statement

This is a review of published literature. No animals were used, no individual case is reported and no ethical approval was required.

12. Data Availability

No new data were generated. All sources are cited in the reference list.

13. References

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