

A SURVEY OF MANAGEMENT PRACTICES FOR BOTTLENOSE DOLPHIN PREGNANCIES WITH EXAMPLES OF BIRTH COMPLICATIONS

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An echography made in March 1989 confirmed that two female dolphins were pregnant at the Brugge dolphinarium. These two pregnancies, each of which resulted in the calf's death, are explored. A survey of pregnancy management and other dystocia in different dolphinaria was undertaken because of these experiences and the results are discussed.

Introduction

This paper started with two cases of dystocia (birth complications) in the Brugge dolphinarium. In 1988 we had seven dolphins, two males (one young and one mature) and five females (three young and two mature). The pregnancies and births happened in our older facility, the one that remained after the fire of May, 1988.

At the end of 1988, it became evident that at least one of the dolphins was pregnant, a four or five year old female. We also expected our 14 year old female to be also pregnant.

In March 1989, we decided to do ultra-sound scanning. We isolated the two females in a part of the pool from which the water level could be dropped. Heart movements were seen in the uteruses of both females. The fetus of the younger dolphin was more advanced than that of the older one.

First case

On the 19th of April, between two shows, one of the trainers saw the dead body of a young dolphin on the bottom of a side pool. It was the calf of the younger dolphin. It was supposed that the birth probably occurred less than one hour earlier. This was a full-term male calf. A necropsy was done.

Lung inflation indicated that the calf had breathed after birth, but the lungs were congested and there was froth in the larynx which may also indicate some respiratory difficulties. No significant lesions were identified on fetal and placental tissues and all bacteriological tests were negative. The cause of death of the calf is unknown. Such things as the young age of the mother and her inexperience may have been contributing factors.

The mother received antibiotics (Amoxicillin, 2 x 3 gm per day) for about one week. Medication was stopped on April 26th. On April 27th, she became anorexic. Three days later, her general condition had deteriorated and

additional clinical signs appeared: depression, persistent anorexia, repeated vomiting of greenish biliary fluid in the beginning and later, hemorrhagic liquid. Therefore, Cephalosporin (2 x 4 gm per day) treatment was started and, in the evening, 2 L (0.53 gal) of water were given orally to the dolphin. A blood sample collected on April 30th revealed severe leukopenia, hyperproteinemia and the presence of band cells. She died on May 1.

Necropsy revealed that the mother's genital tract was characterized by an asymmetric uterus: the left uterine horn was dilated as a result of recent delivery and at the vulva-vaginal margin there were some bruises. At the anterior opening of the pelvis, two hematomas were found. These lesions probably resulted from the birth process ten days before. The opening of the thorax revealed abundant sero-hemorrhagic liquid in the cavity. The lungs were dark red and compact with dozens of sub-pleural hemorrhagic patches. Both trachea and major bronchi contained foam tinged with blood, filling the lumen and protruding through the blowhole. These lesions were indicative of an acute to peracute hemorrhagic broncho-pneumonia.

We believe the animal died from the broncho-pneumonia and the subsequent septicaemia. These findings were supported by bacteriology (*Protease mirabile* everywhere). Pathology of the reproductive tract was probably normal for an animal only ten days post-parturient. The physiological and behavioral complications of early pregnancy and loss of the calf may have predisposed this young animal to the original lung infection.

Second case

During the summer, all three older dolphins participated in the shows, including the pregnant dolphin. Then on the 29th of August, around 9:30 A.M., her labor started. We isolated her from the other dolphins and kept her in the main pool. At the beginning, the calf's tail stick was out about ten cm (3.9 in) and it went out to 20 cm (7.8 in) in the first hour. Then progress stopped. We could see her pushing at regular intervals. We observed her smashing her belly quite hard against the walls and on the bottom of the pool. Three hours later, labor stopped and she simply swam around without trying to push any more.

Four hours after the onset of birth, we considered using oxytocin to help her deliver but decided to wait a while and, if there was no more progress, then try to help her manually.

After five hours of waiting we had one trainer go into the water to see if he could help. We were not expecting a living calf any more. Five minutes after the trainer entered the water, the dolphin came near him. She showed him her belly. He then gripped the calf's tail and started to pull. But this was difficult in the water; the tail was slippery and he could not hang on to anything.

We then decided to move her into the medical pool. She immediately went in the medical pool and waited, without moving, until the water level came down.

One person first tried to pull the calf. Eventually four to five people were needed to pull the calf out and it took five to ten minutes. Every time they were pulling, she was pushing as well. She also synchronized her breath with pushing and we managed to pull the calf out. It was a stillborn male. We then manually retrieved the rest of the placenta.

Necropsy of the calf was done the next day. Apart from several fractures in his backbone and post-mortem hemorrhagic patches apparently due to the manual pulling, we could not find any reason for his death (other than the problematic birth). One explanation of this birth might be that the calf was already dead in utero. Therefore the mother did not receive the normal physiological signs from the calf and her body may have been less prepared for delivery. This might lead to a long birth process.

The female received antibiotics (Penicillin and Clamoxyl - 2 x 3g /7 days) for one week but she seemed in good shape immediately after the birth, accepting food without problems. The next day she participated voluntarily in the show, jumping higher than the last months of her pregnancy, weighting 20 Kg (44 lb) less now. We had no further problems with her after we stopped her medication.

Results of Questionnaire on Dystocia

The author was interested to know if such dystocia had already occurred in other dolphinariums, so a questionnaire on the subject was sent to 56 dolphinariums and institutions. Twenty-five answers were received; an answer rate of 45 percent.

First, an attempt was made to define "difficult birth". It seems that nobody has the same opinion on this subject. In medical terminology it is called "dystocia" and is related to a difficult and/or long labor. But the question is: what is a long labor for a dolphin? Usually it is said that delivery should occur between twenty minutes and one hour. But this comes from the births witnessed in zoos and aquariums. Very little is known about how it happens in the wild.

It was decided to call dystocia a type of birth that lasted longer than the average witnessed with dolphins in dolphinariums. Respondents stated that the basic time of parturition for their bottlenose dolphins ranged from 35 minutes to six hours. Usually parturition lasted between one and two hours, but there was also a seven minute birth.

Another survey question was: When do you qualify a birth as "difficult"? Answers seemed to depend upon the type and number of experiences. They went from "when parturition exceeds 40 minutes" to "more than 12 hours", to "when the mother is contracting or showing signs of discomfort for more than half a day", to "when she seems to be in pain".

Thus, there is no consensus in specifying the limits of what should be called a dystocia in bottlenose dolphins. We can probably call births "dystocia" in dolphinariums if 1) the mother has difficulties, 2) she stops her labor or 3) it

seems that the calf is stuck. However, it is difficult to set an arbitrary time, after which normal birth becomes dystocia.

On a different scale, we can include other things in the determination of the term "difficult birth":

- still-born calves,
- weak or sick calves after delivery,
- weak or sick mothers after delivery,
- loss of appetite before or after delivery,
- mothers without milk,
- mothers refusing their calves, or
- death of a mother with a living calf.

Other information on husbandry of pregnant dolphins from the questionnaire are summarized in the following paragraphs. The percentages are derived from the 25 answers received.

- Most of the time all the dolphins live together in the dolphinarium. When a dolphin is pregnant, some isolate her (65%), some do not (35%). The ones who isolate pregnant dolphins have done it at different times: two to three months before birth; in the last month of pregnancy; only during the night. When a pregnant dolphin is kept with others, it seems that most of the time she seeks relative isolation by not swimming closely with the others.
- Females were isolated from adult males a few weeks before parturition. At parturition time 90% of the dolphinaria put the mother with other dolphins, mainly females (and even calves), but rarely with adult males.
- Seventy-three percent of the dolphinaria use pregnant dolphins in their shows but they sometimes witness changes in the performance of these dolphins. Changes include being slower; less social-minded; some loss of their normal interest for the shows; and performing lower jumps (100%). Some institutions let the dolphin do the show if she so desires; others allow her to display whatever behavior she wishes; others encounter no changes in show performance. There are dolphinaria where the more strenuous jumps are dropped from the show or where behaviors that need a lot of strength and accuracy are left out. Mostly the trainers try to put a stop to high jumps and beaching on platform, but some dolphins still tend to beach anyway (sometimes rolling on their sides, presumably to be more comfortable).
- The average stage of pregnancy at which the dolphins are absolutely withdrawn from the shows is one to three months before delivery, but other answers included: withdrawing the dolphin at an earlier stage (as early as 10 months before expected birth); when she decides to stop; or the last day. In general, the dolphin does not refuse to participate in shows when pregnant, but will do so near delivery time. Most of the time, the dolphin resumes show performance voluntarily after one day of recovery, if she is put with the show dolphins. Sometimes she receives one week to six months to recover (depending on whether the calf is living or not).

- Pregnant dolphins show an increase in appetite and generally there is a raise of 2 Kg (4.4 lb) in their daily food. Some institutions feed them as much as they want but ensure that they are not overfed (a maximum of 10 Kg/day (22 lb/day)). As a complement, they can receive: additional iron tablets; more vitamins; calcium (during lactation); kalium; selenium; or fish hydrated with fresh water.
- Pregnancy is normally monitored. There were as many cases of trainer's care, dependent on the trainer's experience (observation of the dolphin, body shapes, increase of food quantity, activities, temperment) as there were cases of regular veterinary check-ups and veterinary examination (by blood progesterone level). Exams by use of Echography (ultrasound) and a Doppler stethoscope were also reported. Ultrasound allows observation of the fetal heart beat and measures of growth rate. By measurements of the thoracic diameter and the skull width it is possible to estimate the age of the fetus. For example, 5 cm (1.97 in) = four to six months; 10 cm (3.94 in) = eight months and 16.5 cm (6.5 in) = full term (Thoracic diameter: Sweeney. 1989; Gales. 1990).
- At delivery time different kinds of behaviors were witnessed. Many trainers have seen the dolphin hit her belly against walls or bottom of the basin (even when the calf's tail stock was already apparent). Other behaviors observed were included: special calls and sounds; spiraling under water; head stand; tail slapping on water surface; some speed swimming; few contacts with humans. There is rarely aggressiveness. The only one pointed out happened during the adoption case Jacques Smolders told us about last year. A female was delivering while she was taking care of an adopted baby; she tried to bite the adopted baby twice during delivery.
- Medication is rarely given after birth. One dolphinarium gives Clamoxyl (1g, 3 x/day, for six days).
- Some trainers had to help the baby after the delivery; e.g., holding the newborn afloat until the mother takes her calf with her or holding the calf because the newborn did not seem to know what was going on.
- There were only a few positive answers for the question: Have you experienced a difficult birth?. One report said that the only odd birth they had was when the calf's tail stock appeared to be rotated about 90 degrees. However birth took place unaided after two hours and the calf survived for six days. Sam Ridgway only reported two cases of dystocia to me. In one of them the mother (not thought to be pregnant) died in labor; the necropsy showing a huge offspring with a dorsal fin presentation. Another case happened in America years ago. It occurred in a sea basin. A female had difficulty with her delivery and was in labor for some time when another dolphin (a so-called "auntie") helped her. She took the tail fluke in her rostrum and pulled the calf out of the mother. This dolphin is alive today and still has a mark on his tail fluke and is already the father of other calves.

Then we have, of course, the twins' birth which occurred in the Kolmarden Dolphinarium in 1989. It took the mother two hours to have her first calf. Then, for the next one, after three hours of waiting and when the calf's tail was already out, they decided to give 35 mg of Oxytocin IM (intramuscular) to speed things a little. Three minutes after the injection, the calf was expelled. Four hours after the second delivery, the placenta was expelled (there were two different placenta). Both calves were premature: one, of 6.2 Kg (13.6 lb) weight, had a deformed tail stock, thus preventing him from swimming normally. He survived for several hours only. The second one, although premature, survived six days, weighing 12.3 Kg (27 lb) and having a length of 90.5 cm (35.7 in) at his death.

The last dystocia to be mentioned was orally related to the author during another conference. It happened in an European dolphinarium in October 1989. When the trainer came back from a break, the female (who was not known to be pregnant) was swimming around with a calf's fluke out. Progress proceeded during the next the three following hours and the calf was out up to his head (so the dorsal fin and his flippers were out). Then progress stopped. They dropped the water level up to chest level and a trainer went into the water to help. The female didn't let him approach and the accompanying male was quite aggressive. They dropped the water level a bit further, down to the knee. The female at once swam towards the trainer and gripped his leg in her jaws, but she didn't bite. He was then able to grab the calf and pull it. It was quite stuck but was out in 10 minutes. Eventually the trainer retrieved an immature dead calf weighting only 2.7 Kg (6 lb) The mother died from toxemia two days later.

A literature search produced a case of head-first presentation which stopped labour. The veterinarian in charge managed to insert an instrument in the blowhole of the calf and to extract the dead fetus. This procedure saved the mother.

Another interesting paper found on the dystocia subject was written by Jay Sweeney in 1977 and was part of the survey *Breeding Dolphins, Present Status, Suggestion for the Future*, prepared for the Marine Mammal commission (Ridgway and Benirschke. 1977). In that paper it was said that 31% of all *Tursiops* pregnancies in dolphinariums had resulted in stillborn calves, most having occurred at full term of gestation. Stillbirths were more prevalent among recently collected cows who had conceived in the wild. About dystocia it said that parturition resulting in live born calves took significantly less time than those resulting in stillbirths. Data at that time from Marineland of Florida showed 11 live births had a mean parturition time of 54 minutes (maximum was 117 minutes and the minimum was 21 minutes). Nine still births had a mean parturition time of 240 minutes, with the maximum 567 minutes and the minimum 20 minutes.*

* Editor's note: These statistics are from 1977 and likely would not be the same today.

It is not known whether the prolonged delivery time was due to the presence of a dead fetus or whether the fetus died because of this prolonged labor due to some maternal factor. (This is still a question to be answered).

Sweeney's recommendation in his 1977 report was that parturition time should be closely monitored, and if birth has not occurred after 150 minutes, chemical or surgical intervention is indicated. Such a decision is, of course, dependent upon accurate identification of the onset of parturition.

Not that many dystocia have been witnessed in dolphins up to now. This may come from the anatomy of the dolphin: they have no pelvic bone, just a tiny vestigia and the shape of the calf should provide an easy delivery. The only things that can be taken into consideration are the size of the birth canal and perhaps tight muscles.

All of these dystocia were handled with different methods. At this stage it is hard to say if one or another method is good for dolphins or not. It may be said that there is not much relationship between a difficult birth and dolphins still participating in shows. Some dolphinaria have mothers participating nearly until the end in the shows and giving birth to living calves; others isolate the pregnant mothers, but witness lots of stillbirths or loss of calves.

We can only lean on the results achieved nowadays to enable us to help the mother in difficulty. But we also have to continue to study these animals in the wild to better understand the species.

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