

## A survey of management practices for dolphin pregnancy—with two examples of birth complications

Geraldine Lacave

*Boudewijnpark, A. de Baeckestraat 12, 8200 Brugge, Belgium*

### Introduction

This paper is based on two cases which happened in the Brugge dolphinarium. At that time we had seven dolphins—two males (one adult and one immature) and five females (two adult and three immature). These births occurred in our older facility, that survived the fire in May 1988.

At the end of 1988, it became evident that at least one of the dolphins was pregnant, she was 4 to 5 years old and had gained a lot of weight. She was the shyest of the new dolphins. We also expected our 14 year old female to be pregnant.

Starting in March 1989, we decided to carry out an ultra-sound scan. The equipment borrowed was normally used on sheep and the transducer had to stay dry. Therefore we isolated the two females in a part of the pool in which the water level could be reduced.

Heart beats were seen in the uteri of both females. The foetus in the younger dolphin was more advanced than that in the older.

### Case number 1

On 19 April, between the public shows, one of the trainers saw the dead body of a little dolphin on the bottom of a side pool. It was the calf of the younger dolphin. We supposed that the birth occurred in under one hour. This was a full term male calf and a necropsy was carried out.

#### *Necropsy Report*

Inflation of the lungs indicated that the calf had taken a breath after birth, but the lungs were congested and there was froth in the larynx, indicating some respiratory difficulties. No significant lesions were identified in foetal and placental tissues, and all bacteriological tests were negative. The cause of death of the calf remains unknown. Such things as the youth of the mother and her inexperience may have been contributing factors.

The mother received antibiotic therapy (Amoxycillin 3 g twice daily) for one week. Medication stopped on 26 April. The next day she became anorectic. Three days later her general condition had

deteriorated markedly and additional clinical signs had appeared—depression, continuing anorexia, repeated vomiting of a greenish biliary fluid which became blood stained later. Treatment with Cephalixin (4 g twice daily) was started and 2 litres of water were given orally each evening. A blood sample taken on 30 April showed a severe leucopaenia, hyperproteinaemia with the presence of band cells. She died on 1 May and her body was found on the bottom of the tank.

#### *Necropsy report*

The genital tract was characterized by an asymmetric uterus, the left uterine horn being dilated as a result of the recent pregnancy and there was some bruising at the vulvo-vaginal margin. At the anterior entrance to the pelvis two haematomata were found. Both these lesions probably resulted from the birth process 10 days earlier.

Opening the thorax revealed an abundance of a sero-haemorrhagic fluid in the cavity. The lungs were dark red and compact with many sub-pleural haemorrhagic patches. The trachea and the major bronchi contained a blood tinged foam which filled the lumen and extruded through the blowhole. These lesions were indicative of an acute or peracute haemorrhagic broncho-pneumonia.

We believe death resulted from a broncho-pneumonia and the subsequent septicaemia. These findings were supported by bacteriological examination. Pathology of the reproductive tract was probably normal for an animal only 10 days post-parturient. The stress of an early pregnancy and the loss of the calf may have predisposed this animal to the original lung infection.

### Case number 2

During the summer season, all three older dolphins took part in the shows, as did the pregnant animal.

On 29 August, around 9.30 a.m., her labour started. We isolated her from the other animals but kept her in the main pool. At the beginning, the tail-stock of the calf protruded about 10 cm and this increased to 20 cm during the first hour. Progress

then stopped. We could see her straining at regular intervals and observed her thrusting her abdomen quite hard against the walls and the bottom of the pool. Three hours later labour stopped and she just swam around without straining any more. Four hours after the onset of labour we began to think we should do something. We considered the administration of Oxytocin but decided to wait a short while and then, if there was no more progress, try to help her manually.

After five hours from the onset of labour, it was decided that one trainer had to go into the water to see if he could help. We were no longer expecting a live calf. Five minutes later the trainer was in the water. The dolphin came near him without any problem. She showed him her belly so he was able to grip the calf's tail and began to pull. This proved difficult since, in the water, the tail was slippery and he couldn't hold on to it for long. We therefore decided to put the animal in the medical tank, into which she then went by herself. Usually the animals need a little persuasion to enter since they realize something unpleasant is going to happen there. This animal immediately went into the medication pool and waited, without moving, until the water level was reduced. By that time the local veterinarian had arrived.

At first, one person tried to pull out the calf, which was really stuck. Eventually 4 to 5 people were required for 5 to 10 minutes to remove the calf. The dam strained in synchrony with the helpers. She also synchronized her breathing with her straining. When the calf was removed it was found to be a stillborn male. The veterinary surgeon then manually retrieved the rest of the placenta.

#### *Necropsy report*

This was carried out the following day. Apart from several fractures of the backbone and post-mortem haemorrhages, apparently due to the manual interference, we couldn't find any reason for the death (other than the dystocia). One explanation of this birth might be that the calf was already dead in utero. Therefore the mother did not receive the normal physiological stimuli from the baby and her body could have been less well prepared for the delivery. This could have led to a long parturition.

The female received a course of antibiotic therapy (Penicillin and Amoxycillin—3 g twice daily) for one week, but she seemed in good shape from after the birth, accepting food without any problems. The day following she participated voluntarily in the show, jumping higher than in previous months—weighing 20 kg less now! There were no further problems with her after medication stopped.

#### **Resultant Investigation**

I was interested, of course, to know if such dystocia (problematic births) had already occurred in other

dolphinaria, so a questionnaire was sent to 56 dolphinaria and institutions. I received 25 answers—a return of 45%.

First we must define 'difficult birth'. It seemed that everybody used a different definition of this term. In medical terminology it is called 'dystocia' and is related to a difficult and/or long labour. But the question remains, what is a long labour for a dolphin? It is usually said that delivery takes place within 20 minutes to one hour. However this information comes from births witnessed in captivity. Very little is known about what happens in the wild.

We would define dystocia as a type of birth that lasted longer than the average witnessed in captivity. We also compare the birth with the experience we have with other well known species. It could be that 12 hours is a normal time for delivery in the wild. This paper is a survey of what has happened in captivity but we cannot extend it—at least not yet—to a generality.

Question 12 asked:

Would you say that 10 minutes to one hour is the average time for a female to parturite (*sic*)?

If No, is it less?  
is it more?

If Yes, how long would be the average?

The answers varied from 35 minutes to 6 hours but usually between 1 and 2 hours—although one of 7 minutes was recorded.

Question 13 asked:

When do you qualify a birth as difficult?

When it lasts more than 2 hours?  
3 hours?  
4 hours?  
5 hours?  
6 hours?

When the dolphin seems to be in some pain?

When the calf is stillborn?

When the calf is stuck?

When the calf is deformed?

The answers varied from 'when parturition exceeds 40 minutes' to 'when parturition is more than 12 hours' and 'when the mother is contracting or showing signs of discomfort for more than half a day', or 'when she seems to be in pain', depending on the type and number of experiences.

One can therefore conclude that there is no consensus in specifying the limits of what should be called 'dystocia' in bottlenose dolphins. We can probably call a birth dystocic in captivity if:

1. the mother has difficulties,
2. she stops her labour, or
3. it seems that the calf is stuck.

It is difficult however to set an arbitrary time limit. On another front we can include, in the determination of the expression 'difficult birth', such factors as:

stillborn 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,  
 death of a mother with a live calf, etc.

In summary, from the 25 answers received to the questionnaire, we can learn other factors in the husbandry of pregnant dolphins. Most of the time, all the dolphins live together. However, in response to Question 2(b), which asked:

Do you normally isolate pregnant females? and, if so, at what stage of pregnancy?

35% do not isolate her while 65% do isolate her but at:

2 to 3 months before birth,  
 in the last month of pregnancy,  
 only during the night,  
 a few weeks before parturition,  
 separate from adult males and etc.

At parturition, 90% of the dolphinarium put the mother with other dolphins, mainly females (and even calves) but rarely with adult males.

Question 2(e) asked:

If you generally keep her (the pregnant dolphin) with others, what did you find out as her normal behaviour? Does she:

search relative isolation  
 stick closely to the group?  
 or show other changes?

It seems that most of the time the pregnant animal seeks relative isolation, not swimming closely with the others (who seem to have a much closer bond).

Question 15 asked:

Do pregnant females still participate in the shows? If yes, have you noticed any change in their performance?

If no, at what stage of pregnancy do you usually stop them from performing?

The answers showed that 73% of dolphinarium continue to use pregnant animals in their shows but changes in their performances are witnessed, such as:

Slower dolphins,  
 Less social minded dolphins,  
 A little loss of their normal interest for the shows,  
 Lower jumps—this recorded by all respondees.

Some institutions let the animals do the show if they want to. Others allow them to display only the behaviours they choose. Others also encounter no changes in show performances. There are dolphinarium where the most strenuous jumps are dropped from the show or where all behaviours that need a lot of strength and accuracy are left out entirely. Mostly the trainers try to put a stop to high jumps and beaching on the platforms, but it looks as if some animals do it anyway (the latter with the animals sometimes

rolling onto their sides, presumably to be more comfortable).

The average time to finally withdraw the animals from the shows varies from 1 to 3 months before delivery but the replies also showed that some stop:

earlier (up to 10 months before the expected date of birth),  
 when the animal decides to stop, or  
 on the last day.

In general the animals do not refuse to participate in the show until close to the delivery time. Most of the time, the animal resumes show performances voluntarily after one day of recovery if she is allowed to mix with the show animals. Sometimes she is allowed from one week to one month (or more) to recover.

Question 19(a) asked:

What is your daily ration (fish) kg/day for dolphins?

(b) any difference for pregnant dolphins?  
 (c) Any special diet for pregnant dolphins?

The answers showed that, with the increase in appetite, the daily intake is increased some 2 kg. Some institutions feed them as much as they want but still pay attention that they are not overfed (with a maximum of 10 kg per day). As complements they can receive:

additional iron tablets,  
 more vitamins,  
 calcium (during lactation),  
 potassium,  
 selenium, or  
 fish hydrated with fresh water.

Question 20 asked:

How do you normally monitor pregnancy?

There were as many cases of trainers care, dependent on the trainer's experience (observations of the dolphin, bodyshape, increase of food quantity, activities, temperament) as cases of regular veterinary check-ups and examinations (by blood progesterone levels, the use of ultrasound or Doppler stethoscopes). With ultrasound the foetal heart beat can be observed and the rate of growth measured. It is also possible, with this method, to age the foetus by measuring the width of the skull and the thoracic diameter. Personal communications from Jay Sweeney (1989) and N. J. Gales (1990) gave the following measurements:

5 cm, 4–6 months  
 10 cm, 8 months  
 16.5 cm, full term.

Question 8 asked:

If you did witness births under water, did you notice any particular behaviour?

Which ones? Seeking contact with humans?

Hitting the belly against walls or bottom?

Special calls or sounds?

Others?

Many trainers have seen their animals hit their belly against the walls or the bottom of the pools (this could happen even when the tailstock of the calf was presented). Other behaviours reported included:

Special calls and sounds,

Spiralling under water,

Head standing,

Tail slapping on the water surface,

Some speed swimming,

Reduced or few contacts with humans.

Rarely was aggressiveness reported, indeed the only case pointed out was that of Jacques Smolders—reported in *Aquatic Mammals* 14.2, 78 from the Windsor Conference. That female was giving birth while at the same time taking care of an adopted calf. She tried to bite the calf on two occasions while giving birth.

Question 13 asked:

Do you give medication after birth in all cases?

This was rarely given routinely. One dolphinarium however gives Amoxicillin (1 g thrice daily) for 6 days.

Question 6 asked:

Did you actually have to help a dolphin give birth?

Some trainers reported that they have already had to help the baby after the delivery by holding the calf afloat until the mother took the calf with her, or by holding the calf up until it appeared orientated.

Question 4 asked:

Did you already experience difficult births?

The answers received included a case where the tailstock of the calf was rotated 90° about its long axis. Here the birth was unaided but took 2 hours and the calf survived for 6 days. The mother then went off her food but responded after a few days to injections of long acting Amoxicillin and a steroid.

Dr Sam Ridgway reported one case of a dead calf which had to be manually retrieved from the uterus. This was a Dall's porpoise in posterior presentation. Labour had lasted for several hours before help was given and the mother died as well. He also reported dystocia in a Tursiops who was not thought to be pregnant. She died in labour and the necropsy showed a very large calf in dorsal fin presentation.

In America several years ago, in a sea basin, when a female had been in labour for some time, another animal (the auntie?) helped by seizing the tail fluke in her rostrum and pulling the calf out from the mother. This calf is still alive, has a scar on his tail fluke and has fathered other calves.

The twin births at Kolmardens in 1989 are well known. The mother took 2 hours to deliver her first calf. After a 3 hours wait, with the tail already pre-

sented, 35 mg oxytocin were injected intramuscularly to increase the rate of the contractions. Three minutes after the injection the calf was born. Four hours later two separate placentae were expelled. Both these calves were premature. One weighed 6.2 kg, had a deformed tail stock and was therefore unable to swim normally. He survived only 2 hours. The other, although premature, survived 6 days, weighing 12.3 kg and measuring 90.5 cm long at his death.

Another dystocia was reported to me verbally. It occurred at a European dolphinarium in October 1989. The animal was not thought to be pregnant and the trainer, on returning from a break, found the dam swimming around with the calf's fluke out. Progress continued for 3 hours and the dorsal fin and flippers were born, but then progress stopped. The water level in the pool was dropped to chest height and a trainer entered the water to help. The dam did not let him approach and the male was quite aggressive. The water level was then dropped to knee depth. The female was still able to swim and in one movement she swam towards the trainer and gripped his leg in her jaws but did not continue the bite. The trainer was then able to grab the calf and pull it. It was quite an effort and took a further 10 minutes to extricate. Eventually an immature dead calf of 12 kg was born. Unfortunately the mother died from toxæmia 2 days later.

Sweeney (1979) said that 31% of all Tursiops pregnancies in captivity have resulted in stillborn calves, most at full term. Stillbirths are also more prevalent among recently captured females who have conceived in the wild. Parturition resulting in live calves took significantly less time than those resulting in stillbirths.

Marineland of Florida reported that: 11 live births had a mean parturition time of 54 minutes (21–117); 9 stillbirths had a mean parturition time of 240 minutes (20–567).

It is not known if the prolonged delivery time was due to the presence of a dead foetus or whether the foetus died as a result of this prolonged labour due to some maternal factor. (This question has still to be resolved today.)

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

This survey has revealed the paucity of information on dystocia in dolphins up to now. This may be due to the anatomy of the dolphin—lacking a pelvic girdle, there is just a tiny vestige—and the shape of the calf predisposes to an easy delivery. There is nothing to stop the calf. The only thing to take into consideration is the size of the birth canal and, maybe, some really tight muscles.

All the reported dystocias were regulated by different methods. At this stage it is not possible to say if one or the other method is preferable for the dolphin. We must say that there is not much relationship between difficult births and the participation of the mother in shows. Some dolphinariums have mothers participating in shows nearly till the end and still producing live calves, others separate the pregnant females but witness lots of stillbirths or loss of calves.

It is only possible to learn from these results to do our best to help the mother in such difficulties and it is

our duty to help them when in captivity. However we have to continue to study these animals in the wild to help them the better in captivity.

#### **References**

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