



Should Midgestation Fetal Surgery be Considered *Leidah* (Halachic Birth)?

"Speak to the Children of Israel saying: When a woman conceives and gives birth to a male, she shall be impure for a seven-day period..."
(*Vayikra 12:2*)

There are many laws of the Torah that depend upon "*Leidah*" – Halachic birth, including the laws of the firstborn, ritual impurity and *Bris Mila*. It is often important in the context of these laws to establish the precise moment that constitutes a *Leidah*.

In the following paragraphs we will discuss the fascinating topic of open fetal surgery and whether it could constitute an Halachic birth. While in most cases this question has no practical significance (as we shall see), an analysis of this unusual phenomenon helps to clarify the basic principles of Halachic birth.

The *Gemara* in *Maseches Niddah* (40a) records a *Machlokes Tana'im* regarding "*Tumas Leidah*" – ritual impurity contracted by a woman who gives birth via Cesarean section. Although there is no dispute in the *Gemara* as to whether a child born via Cesarean section is considered to have been Halachically 'born', the *Tana'im* argue whether his mother is *Teme'ah Leidah*. The *Gemara* in *Maseches Shabbos* 135a records a *Machlokes* as to whether a child whose mother does not contract *Tumas Leidah* must wait until the eighth day for his *Bris Mila* or if it can take place immediately after birth and whether it would supersede Shabbos. If his *Bris Mila* must take place on the eighth day, it is important to establish the exact moment of his birth,

Regarding an ordinary vaginal birth, there is a *Machlokes Rishonim*¹ as to the precise moment that is considered *Leidah*. Some say that it is the moment that the

¹ This is also argued further by the *Acharonim*.



fetus' head (or the majority of its body) reaches the pelvic floor after the cervix has fully dilated. Others hold that it is only when its head (or majority of its body) emerges from the vagina². The moment of birth in the case of a Cesarean section, however, is even less clear.

The procedure for performing a Cesarean section is as follows: The surgeon makes an incision through the abdominal wall and muscles, followed by an incision in the uterine wall exposing the fetus, and then extracts the fetus. Do we consider the moment that the fetus is exposed (i.e the uterine incision) to be the time of *Leidah*, or is it only when the fetus is removed from the uterus?

A further question: Modern medicine has developed the ability to perform surgeries to repair fetal defects while still in utero. Many procedures are performed fetoscopically by means of surgical instruments inserted through small incisions in the abdominal wall. However, in some cases³, the surgeons perform a hysterotomy (opening of the uterus) to expose the defect and repair it, followed by closure of the uterus and abdominal wall and continuation of pregnancy until delivery. Should open fetal surgery be considered *Leidah*?

This case actually gives rise to another question: Even if we were to consider the open surgery as a *Leidah*, does the fact that the uterine incision is closed and the pregnancy allowed to continue, mean that the *Leidah* is 'retracted'?

The *Mishnah* in *Maseches Chullin* (4:1) says:

[In the case of] an animal that is having difficulty giving birth and the fetus sticks its leg out [of the uterus] but then withdraws it, it is permitted to eat it. If it stuck out its head, even if it withdrew it, it is considered to have been born.

This *Mishnah* discusses the law of a "Ben Pekua" – an animal fetus whose mother was ritually slaughtered before it was born. According to Torah law, it is permitted to eat the fetus without *Shechita* as the mother's *Shechita* is effective for the fetus as well. The *Mishnah* teaches⁴ that if an animal is considered to have been born (*Leidah*), then its mother's *Shechita* is no longer effective for it, even if it subsequently returns to the mother's uterus and the pregnancy continues. *Tosfos* (*ibid.* 68a s.v. *Seyfa*) contend that the basic premise of this *Mishnah* is obvious and

² For an exhaustive list of sources see אגניקלופדיה הלכתית רפואית חלק ד 259

³ The most common open fetal surgical procedure is repair of fetal myelomeningocele (spina bifida)

⁴ As explained by the *Gemara ibid.* 68a



self-evident: Once the animal is considered to be 'born', it cannot revert to the status of an unborn fetus, even if the pregnancy continues!

The *Gemara* (*Chullin ibid.*) extensively discusses various situations that could perhaps be considered *Leidah* as far as this law is concerned. In principle⁵, the emergence of an animal's head or the majority of its body from the uterus is considered *Leidah* while the emergence of one of its legs is not. The *Gemara* (*ibid.*) cites the opinion of *Rav* who holds that in a case where one of the legs of the animal emerged from the uterus, the *Shechita* of the mother will not be effective for that limb that emerged even though it is effective for the rest of the fetus. His source for this is the *Possuk* in *Parshas Mishpatim* (*Shemos 22:30*) "*and the flesh of a Tereifah in the field, you shall not eat*" from which we learn the rule "*once flesh has left its boundaries⁶ it is forbidden*". The limb that emerged from the uterus has "*left its boundaries*" and is thus forbidden to eat, even though it returned to the uterus.

The *Gemara* (*ibid.*) ultimately concludes that according to *Rav* the *Chiddush* of the *Mishnah* relates to the "*Makom haChatach*" – if the limb were to be severed at precisely the point that lay on the boundary between the inside and the outside when it was extended outside the womb, then the location of the cut on the fetus' body would also be prohibited. If the fetus withdrew its limb back into the uterus, then the *Makom haChatach* is permitted to be eaten once the mother has been *Shechted*. If it did not, then the *Makom haChatach* will be forbidden, just like the rest of the limb.

The explanation for this is that the law of *Ben Pekua* (in which a mother's *Shechita* permits the fetus to be eaten), is derived from the *Possuk* that states "*Beheimah ... bi'Veheimah Ossah Tocheilu*"⁷. The word *bi'Veheimah* (which literally means "in(side) an animal") teaches that a *Shechita* is also effective for something that is inside the animal (i.e. the *Ben Pekua*).

However, if a limb emerges from the uterus, then it would not be considered *bi'Veheimah* and the mother's *Shechita* would not be effective for it. If it is subsequently withdrawn it would again be considered *bi'Veheimah* but would be subject to the law of *Rav* that "*once flesh has left its boundaries it is forbidden*". This law applies to the limb, even if it later returns to the uterus.

⁵ Based on the *Gemara* in *Maseches Niddah 28a-29a*

⁶ The *Possuk's* use of "field" is taken to mean any area "outside" of the mother.

⁷ *Devarim 14:6*



Based on these principles we may now return to the *"Makom haChatach"*. This area of the fetus' limb is, on the one hand, not *"outside of its boundaries"* so as to be affected by the law of Rav, but is also not necessarily *"bi'Veheimah"* as long as the limb hasn't been withdrawn. Therefore, if the limb is withdrawn, it can return to being *bi'Veheimah* and is permitted because it was never *"outside of its boundaries"*. But if the limb is not withdrawn then it is forbidden because it is not *"bi'Veheimah"*. In such circumstances, following the *Shechita*, when cutting off the limb that emerged one should cut off a little extra so as to also discard of the *Makom haChatach*.

This explanation is a little difficult to understand. If the *Makom haChatach* is not considered to have been *"outside of its boundaries"*, why is it not considered *bi'Veheimah*? Surely it must either be considered to be *"outside"* in which case it has gone *"outside of its boundaries"*, or *"inside"* in which case it was *"bi'Veheimah"*?

The *Ran* (*Chiddushim* ad. loc.) explains that in order to be considered *"bi'Veheimah"* the area **must be surrounded on all sides by its mother**. The *Makom haChatach*, whilst not strictly *"outside"* of the animal to the extent that it would be considered *"outside of its boundaries"*, is nonetheless not *"inside"* of the animal in its entirety such that it is surrounded by it. It therefore will only be permitted if it is withdrawn.

This *Chiddush* of the *Ran* raises a fascinating question. According to the *Ran*, as far as the laws of *Ben Pekua* are concerned, an animal is only considered to be *"inside its mother"* when she entirely surrounds it and it isn't exposed to the world at all. Could that same principle be true of any Halachic *Leidah*? Is it possible that by exposing a fetus to the world, it would no longer be considered *"in its mother"* and would therefore be understood to have undergone a *Leidah*? On the other hand, perhaps the *Ran* was referring only to the law of *Ben Pekua* that is dependent upon a *physical state* of being *"inside the mother"* but this *Chiddush* cannot be extended to redefine the concept of *Leidah* in general.

Of course, in the case of an ordinary vaginal delivery, this question is irrelevant –the fetus is not at all exposed to the world until it physically emerges from the mother. However, in the case of a Cesarean section (or open fetal surgery⁸),

⁸ Though the mother's uterus and abdomen will be closed following the surgery, this would not 'cancel' the *Leidah* if it is deemed to have taken place. This is evident from the *Tosfos* cited above that once a birth has taken place, it cannot be reversed even if the fetus returns to the uterus and the pregnancy continues.



the fetus is exposed to the world before it physically emerges from the mother. Could that therefore constitute a *Leidah*?

In the case of open fetal surgery, there may be additional reason to consider the surgical exposure as *Leidah*. Not only is the fetus exposed during the surgery but it is also operated upon by human hands, which is completely outside of the normal experience of fetal development. Could this significant interaction – one that resembles the interaction with an already-born individual – impact our determination of whether the procedure is considered *Leidah*?

As stated above, in the case of an ordinary vaginal delivery, there are two opinions among the *Rishonim* as to the moment of *Leidah* – either the emergence of the head from the fully dilated cervix or from the vagina (i.e. “into the world”). In this case, however, there is a different question entirely, in which the situation is reversed – the fetus has been exposed to the world without having left its mother’s uterus!

This question may have Halachic ramifications in the case of a Cesarean section that takes place shortly before sunset. If the uterine incision (i.e. the fetal exposure) is performed before sunset but the fetus is only removed from the uterus after sunset, then its actual day of birth would be in doubt. Did the birth take place before sunset when the fetus was first exposed, or after sunset when it physically emerged from the uterus? This in turn would affect the date that the child’s *Bris Mila* will take place⁹.

As far as open fetal surgery is concerned, this question has little – if any – Halachic ramifications. Since the fetus is not removed from the mother at that time

⁹ This question also has minimal practical relevance as the interval between uterine incision and delivery is very short in the overwhelming majority of Cesarean sections, so it is rare that uterine exposure would occur prior to sunset but delivery would be during *Bein haShemashos*. However, in the ex-utero intrapartum therapy (EXIT) procedure, where the fetus is partially delivered and surgery is performed while the fetus is still connected to the placental circulation, it is theoretically possible for the interval between uterine incision and complete delivery to exceed the duration of *Bein haShemashos* and if the procedure began before *Shekia* and was completed after *Tzais haKochavim* we might have real doubt about the Halachic birthdate. Nevertheless, this would rarely be an actual concern since the EXIT procedure often requires delivery of the head (e.g. in congenital airway obstruction) or a majority of the body (e.g. in sacrococcygeal teratoma resection) which would be considered *Leidah* even though the fetus has not been completely removed from the uterus.



and the pregnancy continues until term¹⁰, there would be no particular Halachic significance to defining the fetal surgery as *Leidah*. This is especially true since labor must be avoided and delivery must be performed by Cesarean section due to the risk of uterine rupture (see *Shulchan Aruch Y.D.* 194:14 regarding *Tumas Leidah* and other *Halachos* in the case of delivery by Cesarean section).

Our dear friend Dr. Ari Weintraub has suggested another case in which these questions could have Halachic ramifications. Scientists at the Children's Hospital of Philadelphia have developed an artificial womb that has been tested in fetal lambs. The fetus is placed into a clear plastic bag filled with synthetic amniotic fluid and the umbilical cord is connected to a machine outside of the bag that removes carbon dioxide from the blood and provides oxygen and nutrition much like the placenta does. When this technique is possible with human fetuses (e.g. in extreme premature deliveries), when would we consider the *Leidah* to have occurred?¹¹

As stated at the outset, this discussion is not intended to address a specific Halachic question but merely to present a discussion in order to clarify the definition and parameters of *Leidah* both in general and in particular regard to Cesarean section and fetal surgery.

¹⁰ Ideally; only approximately one-third of deliveries will occur after 37 weeks following midgestation open fetal surgery.

¹¹ In this case, delivery could occur vaginally, raising additional questions that were not applicable in the cases already discussed.