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Islet Cell Transplant: Successful Survival Through Pregnancy

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BACKGROUND

- Islet cell transplantation for patients with type 1 diabetes mellitus (DM1) has been performed approximately 750 times throughout the world in the last ten years.
- In research trials, transplantation has been used to correct incapacitating recurrent hypoglycemia.
- Pregnant women with pre-existing DM require strict glycemic control to prevent diabetic-related complications including congenital malformations and macrosomia.
- Physiologic changes during pregnancy cause beta-cell proliferation and increased beta-cell mass to match the increased metabolic demands of pregnancy, which is a potential challenge for a patient with an islet cell transplant.

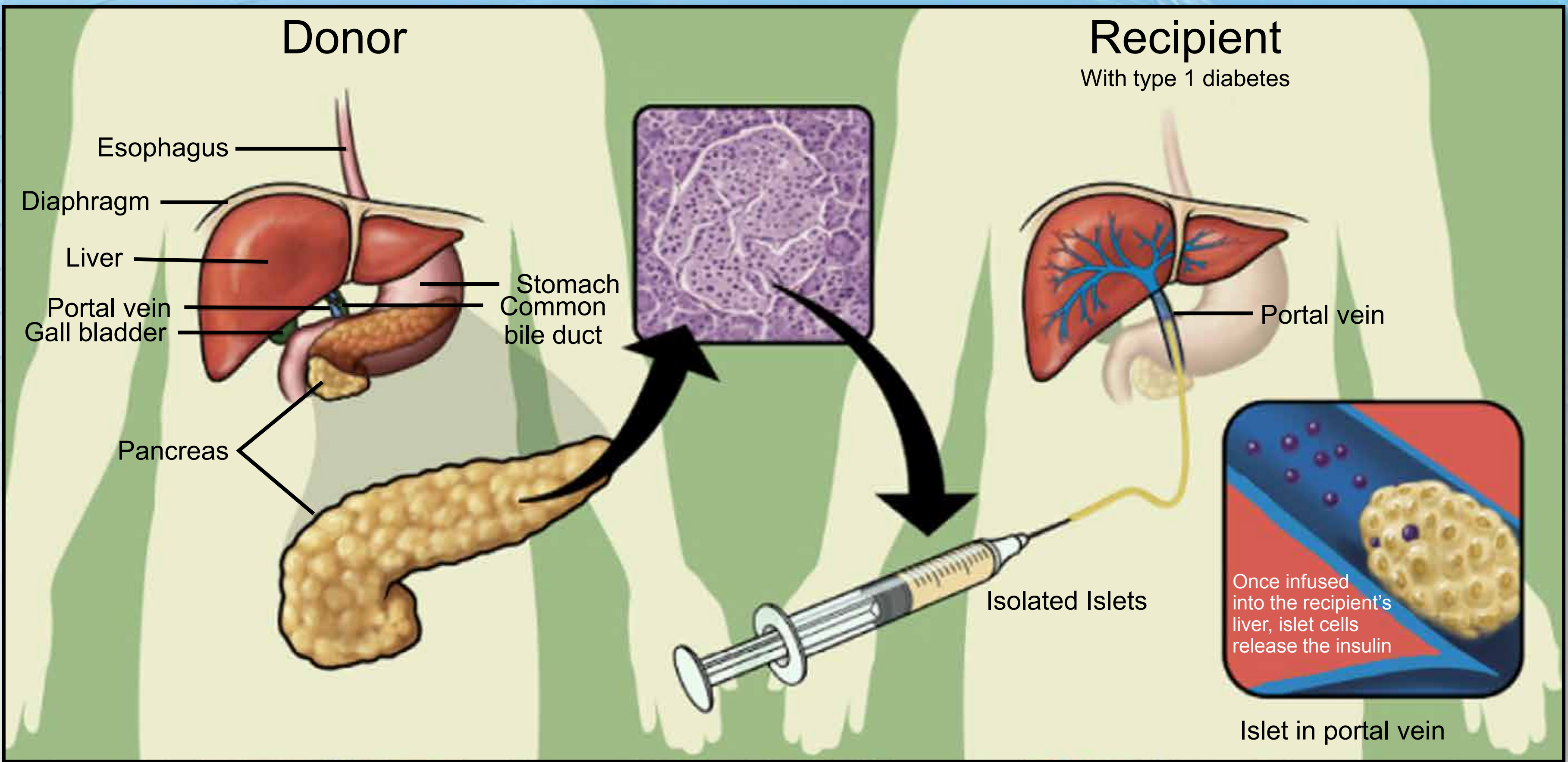
CASE PRESENTATION

A 33 year old G2 P1 with past medical history of DM1 and islet cell transplant is currently carrying her second pregnancy without complications. Diagnosed with DM1 at age 15, she utilized an insulin pump for many years. Her diabetes was complicated by severe hypoglycemic unawareness and she underwent a successful islet cell transplant in March 2011. She was insulin independent for 3 years post-transplant. In June 2014, she presented with her first pregnancy at 5 weeks gestation and her HbA1C was 5.7%. During her first pregnancy, she required 18 units of insulin detemir two times daily without pre-prandial insulin. Her HbA1C at 36 weeks was 5.9%. At 38 weeks, she had a cesarean section for breech positioning and abnormal fetal heart rate tracings and delivered a female 21 inches long, weight 7lbs 8oz and Apgar scores 8,9. There was no neonatal hypoglycemia, however left hydronephrosis was noted. Detemir insulin was discontinued on the day of delivery. She remained normoglycemic and insulin-independent post-partum. In July 2016, the patient was found to be eight weeks pregnant with an estimated due date of 2/27/17. Her HbA1C on presentation was 5.4% from February 2016. Her most recent HbA1C at 18 weeks is 5.6%. She is currently requiring 11 units glargine two times daily without pre-prandial insulin. Current ultrasounds show normal fetal anatomy and growth without complications.

Pregnancy	1st Trimester HbA1C	2nd/3rd Trimester HbA1C	Basal Insulin Required	Apgar Scores	Newborn Weight	Newborn Length	Insulin Post-Partum
First (2014)	5.7%	5.9%	18U BID (0.42 U/kg)	8,9	7lbs 8oz	21 in.	No
Second (2016)	5.4%	4.8%	30U BID (0.70 U/kg)	8,9	7lbs 9oz	20.5 in.	No

DISCUSSION

- This is the first case report to outline the clinical course of a patient with islet cell transplantation who has been pregnant two times.
- During both pregnancies, she only required basal insulin to maintain optimal glycemic control.
- After both pregnancies she did not require insulin and remained normoglycemic.
- It is currently unknown how pregnancy ultimately affects transplanted islet cell function in the long term.



UPDATE

- At 20 weeks gestation, her HbA1C was 4.8%.
- At 38 weeks, the patient was requiring 30 units of glargine twice daily.
- On 2/14/17, at 38 weeks 1 day, the patient presented to the hospital with premature rupture of membranes.
- On 2/15/17, the patient underwent a repeat low transverse C-section for breech positioning without complications.
- She delivered a female 20.5 inches long, weight 7lbs9oz and Apgar scores 8,9.
- After delivery, the patient had multiple episodes of hypoglycemia requiring frequent interventions. Post-partum hypoglycemia resolved on day #3.
- Long acting insulin was discontinued on day of delivery and the patient is insulin independent again with fasting blood sugars < 80 and post-prandial blood sugars <110.

Image Reference:

1. <http://www.discoverymedicine.com/Eric-H-Liu/2009/07/16/islet-transplantation-and-the-challenges-of-treating-type-1-diabetes/>

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