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OBSERVATIONS ON OVARIAN AUTOTRANSPLANTATION IN
EXPERIMENTAL ANIMALS

by

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Introduction

To bypass the histocompatibility barrier in rabbits and in bitches, and to assess the feasibility of vascular anastomosis in ovarian zone, autotransplantation of ovaries in these 2 animals was planned. This operative exercise only will allow one to venture in ovarian auto transplantation in human cases (Raha and Lahiri, 1977). There are some inherent difficulties in taking up experimental work with ovary, particularly when it was undertaken to project the experience in human being.

Material and Methods

Rabbits (average weight, 2 kg) and

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bitches (average weight 6 kg) were selected for auto transplantation of ovaries. Open ether anaesthesia and I.V. pentothal anaesthesia was used in cases of rabbits and bitches respectively.

Abdomen was opened by longitudinal incision and ovaries were identified which are situated high up on either cornual end of the uterus. The ovary was held by Babcock's forceps and gently retracted to identify the vascular pedicle. The pedicle was clamped by small vascular haemostatic clamps (U.S.A.) and removed. Similar procedure was carried out on the other side. The ovary of one side was then transplanted on the other side by anastomosing the ovarian arteries by 000000 taffion atraumatic sutures passing through the wall of the vessel, without being allowed to go through the lumen. Magnifying spectacles (Kell, U.K.) and stereomicroscope were taken help of at the time of vascular anastomosis. The vascular clamps were then gently released to see

any leakage. The ovaries were then inspected for few minutes to note its vascularity and the abdomen was closed in layers. The technique was the same in rabbits and bitches. The abdomen was again opened at different periods in different groups and ovaries were taken out for histological study.

Results

One hundred ovaries in rabbits and 50 ovaries in bitches were studied. In ovaries of rabbits the postoperative days, 3, 7, 10, 14, 21 and 28 and in bitches 7, 10, 14 and 21 postoperative days were selected for taking out the ovaries following auto transplantation. The ovaries were subjected to histological sections. Table 1 summarizes the results in rabbit and Table II that in bitches.

Discussion

Experimental transplantation of ovaries to resume hormonal function had been attempted long before (Caste and Philips,

1909). At that time vascular anastomosis was not attempted likewise. In the report of Camilleri *et al* (1976), success was claimed in autograft transplantation in guineapig. They placed the ovaries in the posterior aspect of broad ligament and omentum was used to cover up the operative area. No vascular anastomosis was attempted. Goldman (1974) reported ovarian allotransplantation in inbred mice and 9 out of 9 ovaries functioned for 50 days when placed in the femoral muscle of the recipients.

That human ovary can be kept functioning even in vitro through isolated perfusion for 8½ hours (Baggish *et al*, 1972) was known but it is felt that if human allotransplantation is to be attempted for ovarian agensis/dysgenesis to bring about fertility then surgical acumen in ovarian vascular anastomosis is to be acquired. The autotransplantation operations were performed in rabbits and bitches wherein the ovaries were taken out from its anatomical position and then

TABLE I
Ovarian Autotransplantation in Rabbits

Presence of Graffian follicle with healthy ovarian tissue.	Partial Necrosis with some active Graffian follicle	Hilar Necrosis with healthy cortex	Cortical Necrosis with healthy stromal cells	Partial Necrosis with atrophic follicle	Total Necrosis	No representative material	Total
4 (3)	2 (3)	4 (3)	2 (3)	3 (7)	14 (7)	3(7)	
5 (7)	7 (7)	5 (7)	2 (7)	2 (10)	1 (10)	4(21)	
3, (10)	1 (10)	2 (10)		1 (21)	4 (21)	4(28)	
2 (14)	3 (14)	2 (14)		3 (28)			
6 (21)	2 (21)	2 (28)					
3 (28)	4 (28)						
Total: 23	19	15	4	9	19	11	100
Per- 23%	19%	15%	4%	9%	19%	11%	
centage.							

Figures within brackets indicate the number of postoperative days when the animal was sacrificed.

TABLE II
Ovarian Autotransplantation in Bitches

Presence of Graffian follicle with healthy ovarian tissue	Partial Necrosis with some active graffian follicle	Hilar Necrosis with healthy cortex	Cortical Necrosis with healthy stromal cells	Partial Necrosis with atrophic follicle	Total Necrosis	No representative Material	Healthy ovary with corpus luteum. No Necrosis	Total
7 (7)	7 (7)	4 (10)	Nil	Nil	5(7)	2(7)	1(10)	
8 (10)	3 (10)	6 (7)			2(10)			
4 (21)	1 (14)							
Total: 19	11	10	Nil	Nil	7	2	1	50
Per-centage 38%	22%	20%	0%	0%	14%	4%	2%	

Figures within brackets indicate the number of postoperative days when the animal was sacrificed.

immediately through ovarian vessel anastomosis the ovary was placed in position and the histology was performed in different time period (3 days—28 days in rabbits and 7-21 days in bitches) as mentioned in Tables I and II. Of 100 experiments in rabbits, 23% showed healthy ovarian tissue and 19% showed partial necrosis with intact graffian follicle. So overall 42% showed more or less surgical success. This figure was 60% in bitches. Thus it may be assumed that surgically, viability of ovaries could be maintained after severing ovarian blood supply and then restoring it. Apparent better results in bitches do not signify a better surgical maneuverability in that animal because the ovaries in bitches are placed very high up near the diaphragm and the size of the ovary and ovarian artery is certainly not bigger than those are in rabbits. As such the bicornuate uterus in both the animals can not serve as an exact model, to human being.

Summary

Ovarian autotransplantations in rabbits and bitches were performed and the success proved that this is surgically feasible though the bicornuate uterus in both the animals could not be the exact human model. The idea of adopting, such an experiment and the results were discussed.

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