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Autoplastic and homoplastic parathyroid transplantation.

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Six cats were thyroparathyroidectomized and autoplastically grafted with the two external parathyroids. In four animals the glands were implanted into a pocket cut in the sternohyoid muscle; the remaining two cats were transplanted in the *rectus abdominis* muscle. The parathyroids were dissected free from all investing membranes, the dissection being done in a half and half mixture of warm, sterile Ringer's solution and blood serum of the animal from which the glands were taken. In some instances the parathyroids remained in the solution for fifteen minutes before implantation. Table I summarizes the principal results of the experiment.

In a series of homoplastic transplantations, twenty-eight cats were used, the donor of the glands being of the same sex as the recipient, and as nearly the same age as possible. The grafts were of two types with respect to the time when made: (1) immediately following the onset of tetany symptoms; (2) simultaneous or criss-cross operations in which the parathyroids of two cats were exchanged. Tables II, III, IV summarize the chief results of the various types of operation.

TABLE I.

Cat	Location of graft	Symptoms following thyroparathyroidectomy		Recovery	Reexcitration of graft	Result	Remarks
		Tetany	None				
1	Rectus abdominis muscle	Tetany		Complete	36 days after implantation	Fatal tetany	Graft in good condition. Central area replaced by connective tissue.
2	Sternohyoid muscle	Tetany		Complete	33 days after implantation	Fatal tetany	Graft in good condition. Both glands healed in. Central area replaced by connective tissue.
3	Sternohyoid muscle	None		Complete	31 days after implantation	No symptoms	Graft in good condition. Central area replaced by connective tissue. Accessory glands found at autopsy.
4	Sternohyoid muscle	Tetany		Complete	37 days after implantation	No symptoms	Graft in good condition. Central area replaced by connective tissue. Accessory parathyroids probably present.
5	Rectus abdominis muscle	Tetany		Complete	34 days after implantation	Chronic tetany	Graft tissue well preserved. Central area as in other cases. Small accessory parathyroids found in thymus.
6	Sternohyoid muscle	None		Complete	30 days after implantation Glands not found	No symptoms	Graft not located.

TABLE II.
Grafts of the parathyroid into the ear following the onset of tetany.

Cat	Sex	Weight	Symptoms after thyroparathyroidectomy	Grafted	Symptoms	Result	Duration of experiment after grafting	Weight	Remarks
34	♀	gm. 550	Tetany and depression	5th day after operation	Tetany and depression	Death	days 4	gm. 450	Graft degenerate. Little vascular connection.
35	♀	820	Tetany and depression	3rd day after operation	Tetany and depression	Death	4	560	Degeneration of graft. Poor vascularization.
37	♀	2250	Tetany	4th day after operation	Tetany	Death	6	1630	Graft degenerate.
38	♀	600	Tetany and depression	4th day after grafting	Tetany and depression	Death	5	502	Graft degenerate.
41	♂	2600	Tetany	7th day after operation	Tetany	Death	6	1000	Graft degenerate.
42	♂	1801	Tetany	2 days after operation	Tetany	Death	4	1740	Graft degenerate.

TABLE III.
Grafts into the Rectus abdominis muscle after onset of tetany.

Cat	Sex	Weight	Symptoms after thyroparathyroid-ectomy.	Grafted	Symptoms	Result	Duration of experiment after grafting.	Weight	Remarks
50	♂	gm. 320	Tetany	24 hours after operation	Tetany and depression	Death	days 3	gm. 290	Degeneration of the graft.
52	♀	420	Tetany	24 hours after operation	Tetany	Death	2	408	Graft not sectioned.
64	♀	2985	Tetany	2 days after operation	Tetany	Death	10	2250	Degeneration of graft.
65	♂	2010	Tetany	24 hours after operation	Tetany	Death	4	1800	Degeneration of graft.
66	♂	2001	Tetany	2 days after operation	Slight tetany	Recovery	32*	1979	Part of graft persisted in fair condition.
68	♂	3660	Tetany	2 days after operation	Tetany and depression	Recovery	36*	3400	Degeneration of graft. Accessory parathyroids probably present.

*Animal succumbed to adrenal insufficiency due to removal of both adrenals. This accounts for the weight loss.

TABLE IV.
Transplantation of parathyroids into the Rectus abdominis muscle before the onset of tetany.

Cat	Sex	Weight	Symptoms	Result	Duration of experiment	Weight	Remarks
53	♂	gm. 650	Depression	Death	days 3	gm. 600	Graft poorly vascularized. Not sectioned.
54	♀	1510	Tetany	Death	7	1205	Degeneration of the grafted glands.
55	♀	2420	Slight tetany	Recovery*	Graft removed after 21 days.	2020	Parts of grafted glands persisted in fair condition. Accessory parathyroids probably present.
56	♂	5050	No symptoms	Recovery	No symptoms 22	4786	Degeneration of graft.
57	♂	3240	Tetany	Recovery	20	3915	Degeneration of graft. Small accessory parathyroid found in thoracic thymus.
58	♂	3011	No symptoms	Recovery	Graft removed after 10 days.	3024	Degeneration of graft. Peripheral border in fair condition.
59	♂	3565	Tetany	Death	No symptoms 7	3430	Degeneration of graft.
60	♂	1210	No symptoms	Recovery	12	1314	Degeneration of graft. Accessory parathyroid found in thymus.
61	♂	2540	Tetany	Recovery	30	2601	Degeneration of graft. Accessory parathyroid tissue not found.
69	♀	3160	No symptoms	Recovery	30	2540	Parts of both grafted glands persisted in fair condition.
70	♂	3120	Tetany	Death	3	3020	Graft not sectioned.
71	♂	2750	Tetany	Death	4	2610	Degeneration of entire graft.
72	♀	3420	Tetany	Death	4	3360	Gland area well vascularized. Grafts made subcutaneously on account of pregnancy. Could not locate the grafts later.
73	♀	1824	Tetany	Death	4	1773	Great degeneration of the grafted tissue. Glands well vascularized.
74	♀	2700	Tetany	Death	7	2100	Degeneration of central area of graft. Peripheral area persisted in fair condition.
75	♀	2250	No symptoms	Recovery	45	2478	Parts of both glands in fair condition.

* It is probable that most of the cats which recovered had accessory parathyroids.