when the last measurements were made, the mean areas of the ear regenerates in both abdominally operated groups were significantly higher than the controls ($P < 0.010$ in both cases). In males the growth rate fell progressively after the initial acceleration. It would thus appear that surgery can affect the regeneration rate at a distant site, and that the effect is greater and lasts longer in females than in males.

Table I. Effect of abdominal wounding on regenerative growth in males

Group	Treatment	Days after excision	N	Mean area of regenerate as % of initial lesion	Standard error of mean
1	Abdominal wound made at the time of ear tissue excision	14	5	50.7	±5.3
		21	5	66.4	±6.1
		28	5	70.3	±4.3
		35	5	78.6	±5.1
		42	5	79.2	±5.9
		49	5	88.3	±4.6
2	Abdominal wound made 14 days before ear tissue excision	14	6	50.5	±3.7
		21	6	61.7	±5.4
		28	6	71.6	±6.3
		35	6	77.8	±6.6
		42	6	81.1	±6.9
		49	6	86.8	±6.0
3	Control males without abdominal wounds	14	18	22.3	±3.5
		21	18	49.1	±2.4
		28	18	63.9	±2.8
		35	18	72.8	±2.6
		42	18	77.0	±2.8
		49	18	85.2	±2.6

Table II. Effect of abdominal wounding on regenerative growth in females

Group	Treatment	Days after excision	N	Mean area of regenerate as % of initial lesion	Standard error of mean
4	Abdominal wound made at the time of ear tissue excision	14	8	48.7	±2.7
		21	8	61.2	±3.5
		28	7	75.9	±5.4
		35	8	88.0	±4.2
		42	7	91.0	±3.5
		49	7	97.6	±3.2
5	Abdominal wound made 14 days before ear tissue excision	14	6	44.1	±2.9
		21	6	67.2	±4.4
		28	6	72.4	±2.9
		35	6	78.9	±4.6
		42	6	88.5	±2.3
		49	6	89.6	±3.8
6	Control females without abdominal wounds	14	11	21.6	±4.1
		21	11	38.9	±5.0
		28	12	45.3	±5.6
		35	12	57.1	±5.6
		42	12	63.2	±5.5
		49	12	67.2	±4.9

The mechanism by which operative procedures affect distant regeneration has not been established. Although the possible release of a wound hormone from the abdominal wounds cannot be discounted, it may be that changes in the hormonal environment in response to stress are concerned. Such changes do occur[4,5], particularly in response to surgical stress[6]. Since the hormonal environments of males and females are different, it could also account for the different responses in growth rate found in males and females towards the end of the regenerative process. Provided that the nerve supply to the injured part is intact[7] there is a pituitary-adrenocortical response to surgical stress resulting in an increased level of ACTH in the blood and an increased output of glucocorticosteroids[8]. The latter may help to initiate the regenerative process by intensifying protein metabolism and making amino acids and nucleoprotein available for use in the later, anabolic, phase of repair. Since ACTH stimulates adrenal androgen production[9] and many androgens are anabolic agents, these may also stimulate regeneration. It has been demonstrated that the adrenal glands are larger, and the plasma concentrations of adrenal hormones higher, in female rats than in males[10]. This may explain, if it is also true for rabbits, why the stimulation of regenerative rate was greater in females after surgical stress than in males, and why it persisted longer in females[11,12].

Zusammenfassung. Verwundung induziert Regeneration in entfernten Stellen bei männlichen und weiblichen Kaninchen. Dies gilt für frühe Regenerationsstadien bei männlichen Tieren, während bei Weibchen die Regenerationswirkung mindestens 49 Tage anhält. Es wird vermutet, dass es sich um hormonale Einwirkungen infolge Stress handelt.

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Lymphostatic Retinal Haemangiopathy

A prelymphatic-lymphatic pathway has been described in the wall of cerebral blood vessels, leading protein and tissue fluid to the cervical lymphatics. Blockage of this system results in oedematous alterations in cerebral blood vessels; the term 'Lymphostatic Cerebral Haemangiopathy' was coined for this new entity of angiological pathology[1-3].

Further studies revealed the fact that – although *there are no lymph vessels in the retina – blockage of the cervical lymphatic system results in a Retinal Lymphostatic Haemangiopathy* too.

Albino rats were subjected to a cervical lymph blockage and to a sham operation, respectively. On the 5th postoperative day, the animals were anaesthetized with

Nembutal; the bulbus oculi was protracted and transected in the plane of the equator (slightly behind the origin of the iris).

Having discarded the lens and the vitreous body, the retina could easily be taken out. The retina was then fixed in osmic acid (Millonig) for 1 h, dehydrated in alcohol and embedded in Durcupan (Fluka). Thin sections (silver interference colour) were prepared on a Porter-Blum ultramicrotome and mounted on 300-mesh uncoated grids. Sections were stained with lead citrate according to Reynolds and studied under a Tesla 242D table electron microscope.

Basement membranes of the blood vessels in retinae of rats subjected to a cervical lymph blockade appear to be conspicuously thickened as contrasted to their normal appearance in sham operated animals. Another remarkable feature of the thickened basement membranes is the appearance of a fibrillar substance that usually cannot be seen under normal conditions. Most probably these fibrils become apparent by virtue of swelling of the basement membrane proper being in an indistinguishable compactness under normal conditions.

Obviously diffusion processes through these thickened basement membranes differ considerably from those under normal conditions.

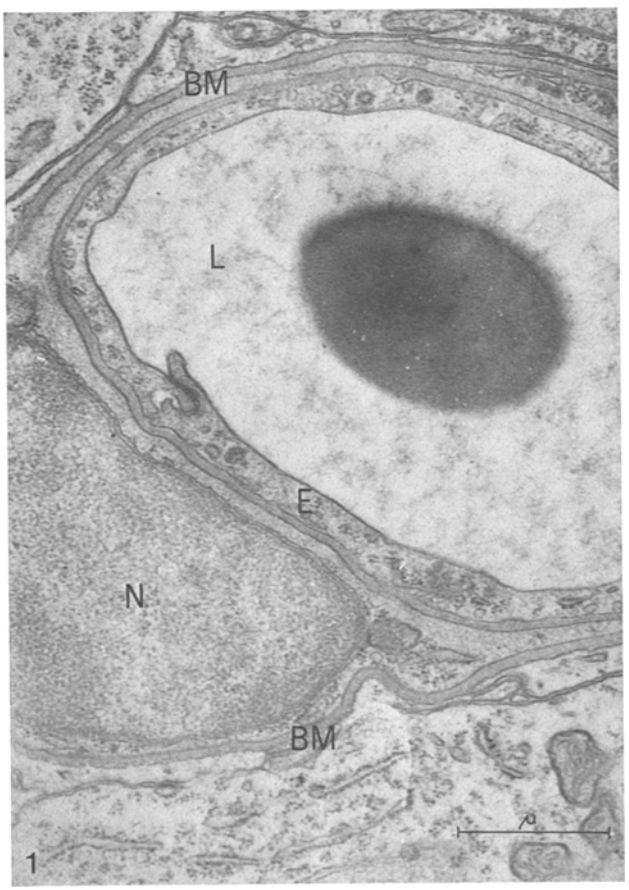

Fig. 1. Blood vessel in the external plexiform layer of the retina in a sham operated rat. L, lumen of the blood vessel; E, endothelium; BM, basement membrane; N, nucleus.

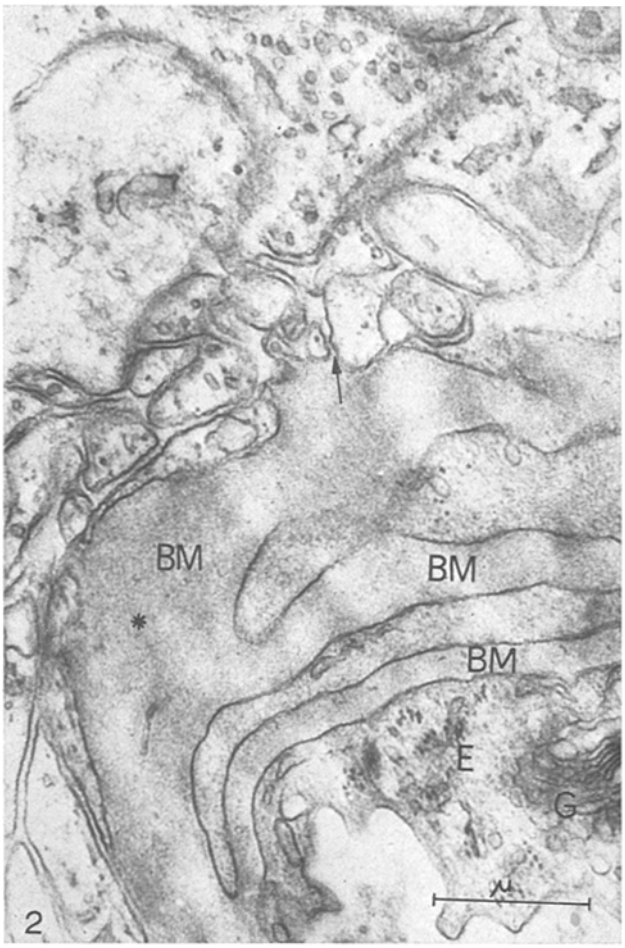

Fig. 2. Blood vessel in the external plexiform layer of the retina in a rat subjected to cervical lymphatic blockage. G, Golgi apparatus of the endothelial cell; BM, basement membrane; E, endothelium. Note the conspicuous thickening of the basement membranes and the appearance of a fibrillar structure within the basement membrane (×). ———, point at an immediate contact channel between extracellular space of the neuropil and the basement membrane.

Zusammenfassung. Verschluss der zervikalen Lymphbahnen führt zu einer lymphostatischen, retinalen Hämangiopathie mit Verdickung und Strukturveränderung der Basalmembranen.

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