



The histological effects of the use of bevacizumab in the surgical site after trabeculectomy

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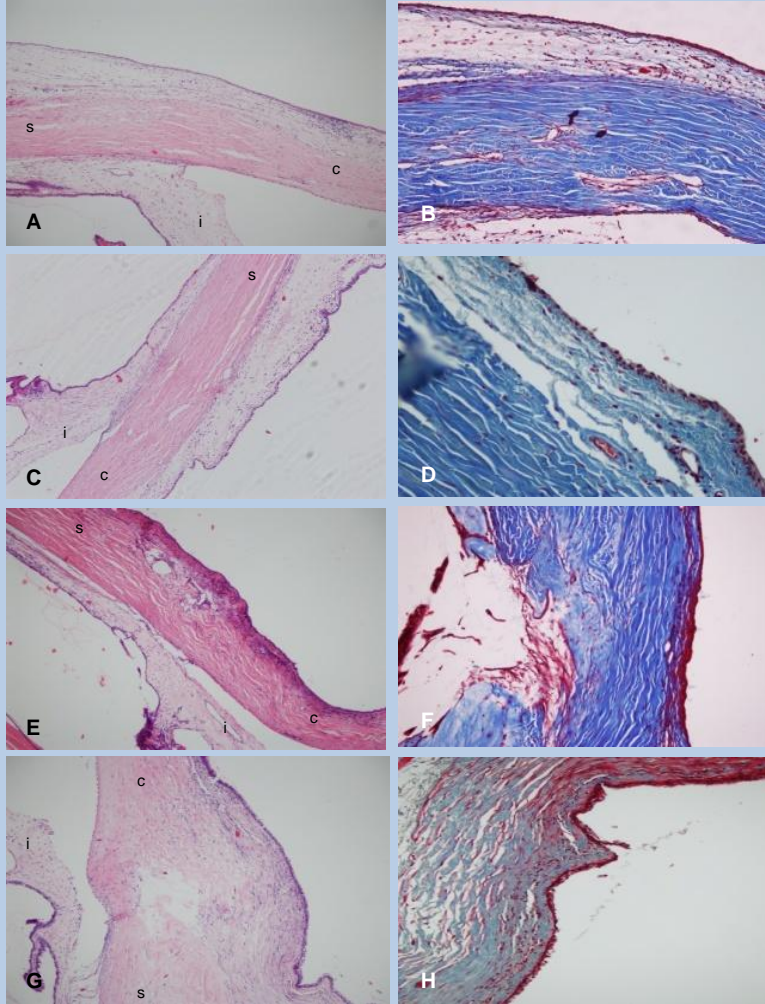
Purpose

- Glaucoma filtration surgery remains the most effective surgical procedure for lowering intraocular pressure in uncontrolled glaucoma.
- Modulation of wound healing is critical to ensure long-term surgical success.
- Nowadays, new treatment modalities are sought to increase the success of surgery while minimizing fibrosis.
- This study aimed to determine if bevacizumab is an alternative agent for wound modulation in glaucoma surgery.

Materials and Methods

- Forty-eight eyes of New Zealand rabbits were divided into 4 groups undergoing standard trabeculectomy surgery in the right eye.
- In group 1, balanced salt solution injections (0.1 mL) were performed into the bleb.
- Bevacizumab (0.1 mL, 1.25 mg) was injected into the bleb in group 2 and into the vitreous body in group 3.
- Subconjunctival injections of 5-fluorouracil were performed into the non-bleb area in group 4.
- Right eyes of two animals from each group were enucleated in 10th, 20th, and 30th day postoperatively and evaluated histopathologically for inflammation, neovascularization, and fibrosis.

Results



Group 1: A (HEx100), B (trikromx200)
 Group 2: C (HEx100), D (trikromx200)
 Group 3: E (HEx100), F (trikromx200)
 Group 4: G (HEx100), H (trikromx200)

Table 1. Histopathological evaluation according to days and groups.

	Subject no	Day 10			Subject no	Day 20			Subject no	Day 30		
		inf	neo	fib		inf	neo	fib		inf	neo	fib
Group 1	11	2	2	1	9	2	2	1	7	2	2	1
	12	2	2	1	10	2	2	1	8	2	2	1
Group 2	23	2	2	1	21	1	1	0	19	1	1	0
	24	1	1	0	22	1	1	0	20	1	1	0
Group 3	35	2	2	1	33	1	2	1	31	2	2	1
	36	2	2	1	34	1	2	1	32	2	2	1
Group 4	47	1	2	1	45	1	1	1	37	2	2	1
	48	2	1	1	46	1	1	1	41	2	2	1

Inflammation ($p=0,030$), neovascularization ($p=0,004$), and fibrosis ($p<0,000$) in group 2 were lower in histopathological evaluation.

Discussion

- It is shown that even in the strong wound healing reaction of this model, anti-VEGF antibodies may have a positive effect on the results of trabeculectomy.
- In the subconjunctival bevacizumab-applied eyes, histopathologically, tissue cellularity, formation of new blood vessels, and collagen deposition have shown a significant decrease with respect to other groups on days 10, 20 and 30.

- On looking at other studies, Memarzadeh et al* have found that there is a significant reduction in scar formation and tissue cellularity on postoperative days 10 and 20 in the bevacizumab groups.
- Li et al**29 have examined the effectiveness of bevacizumab on inflammation, angiogenesis and collagen deposition, and found no difference between the control group and bevacizumab group in terms of inflammatory cell reaction.
- However, they reported that the formation of new blood vessels and collagen deposition was statistically significantly lower in the bevacizumab group.

*Memarzadeh F, Varma R, Lin LT, Parikh JG, Dustin L, Alcaraz A, et al. Postoperative use of bevacizumab as an antifibrotic agent in glaucoma filtration surgery in the rabbit. Invest Ophthalmol Vis Sci. 2009;50:3233-3237.

**Li Z, Van Bergen T, Van de Veire S, Van de Vel I, Moreau H, Dewerchin M, et al. Inhibition of vascular endothelial growth factor reduces scar formation after glaucoma filtration surgery. Invest Ophthalmol Vis Sci. 2009;50:5217-5225.