

**Original Article****Vascularization Imaging Of Conjunctival Bleb As The Anti-Vegf Injection Of Bevacizumab Administered Prior To Trabeculectomy****N. Waspodo^{a*}, R. Syawal^b**^{a,b}Hasanuddin University, Department of Ophthalmology, Faculty of Medicine, Jl. Perintis Kemerdekaan Km.10 Tamalanrea, Makassar, South Sulawesi, Indonesia**ARTICLE INFO****Keywords:**

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(Moorfield Bleb Grading System)*

ABSTRACT

Aim : This study was conducted to observe the vascularization imaging of conjunctival bleb as subconjunctival anti-VEGF injection of bevacizumab administered. **Method :** One day before trabeculectomy surgery in patients with primary glaucoma who has been administered of anti-VEGF bevacizumab subconjunctival for 1.25 mg / ml. Conjunctival bleb vascularization imaging was evaluated using a comparative overview of Moorfield criteria Grading System. **Results :** Evaluation of day 1, 14 and 30, based on Moorfield criteria Grading System showed improvement of conjunctival bleb vascularity, and the vascular appearance vanished on day 30 (21.2% avascular) **Conclusion :** The administration of anti-VEGF injection of bevacizumab showed positive results with the decrease and disappearance of vascularization (vascularization as a cause of failure due to fibrocyst formation of subconjunctival bleb). It shows the process of wound healing and bleb formation improvement as the subconjunctival injection of bevacizumab administered prior to trabeculectomy surgery.

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Introduction

In 1983 Senger found that VEGF is a derivate of tumor-producing factor which increases vascular permeability of arteries, veins and capillaries. VEGF has four major biological activity, all of which play a role in the induction of angiogenesis, namely (1) for the growth and proliferation of vascular endothelial cells, (2) migration of vascular endothelial cells, (3) survival of immature endothelial cells to prevent apoptosis and (4) increasing capillary permeability. Under normal circumstances VEGF controls the process of angiogenesis by maintaining the degree of neovascularization within normal limits. VEGF expression in embryogenesis is essential for vascular development. Disturbances in VEGF allele causes vascular formation becomes imperfect. VEGF also plays a role in the change of immature blood vessels produced by vasculogenesis. At postnatal angiogenesis, VEGF working on immature blood vessels in the form of elongation and prevent apoptosis of endothelial cells. If VEGF no immature blood vessels will then regresses. VEGF also serves as an endothelial cell mitogen that is a cell survival factor for endothelial cells prevent apoptosis. (Takahashi, H., Shibuya, M., 2005).

Trabeculectomy is a by pass surgery that drains fluid from the posterior chamber of aqueous humour directly to the subconjunctival space by making conjunctival flap and scleral flap by cutting out a small portion trabecular tissue and iris. (Luntz, M. H., Trope, G.E. 2005)

Scleral flap is made to play a role such a valve to drain enough aqueous humour to subconjunctival space thus the result of IOP is within normal limits. The square shape of scleral flap size is 4x4 or 4x5 mm. However, the triangular shape of scleral flap is often made by ophthalmologists. (Migdal, C., Trope, G.E. 2005)

Cutting out the trabecular meshwork (2x2 or 2x3 mm wide) and iris tissue (peripheral iridectomy) with the aim of making the direct flow of aqueous humour from posterior chamber through the valve chamber to the sub-conjunctival scleral flap. Iridectomy was performed to prevent the closing of the trabeculectomy hole by iris. Scleral flap and conjunctival flap closure were performed using nonabsorbable suture Nylon 10-0. Suturing techniques can be done disconnected (interrupted) or removable (releasable sutures). (Migdal, C., Trope, GE 2005)

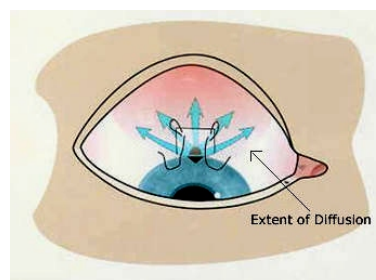


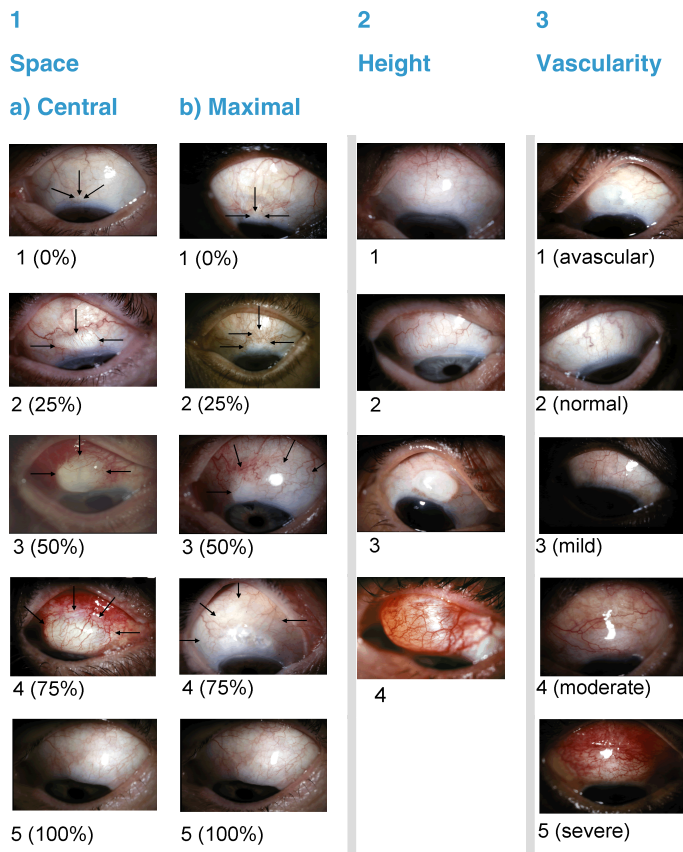
Figure : The direction of aqueous humour flow (arrow raider) to the subconjunctival space through the scleral flap (frontal cross-section)

(Courtesy of Khaw, PT, Trope, G .e., 2005. Advances in Wound Healing the Modulation of Large Including Treatment spaces and Adjustable sutures. Glaucoma Surgery.)

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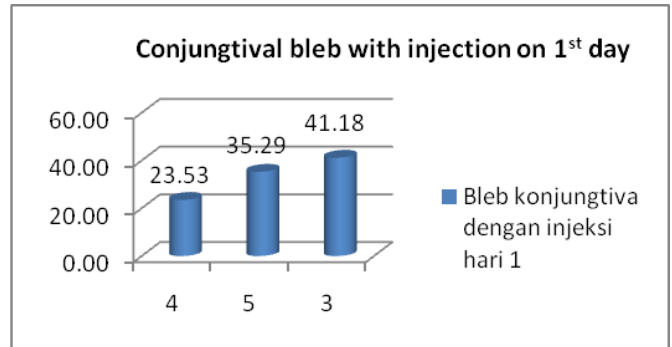
Conjunctival bleb formation then assessed according to "Moorfields Bleb Grading System" (MBGS). There are three main criteria that must be assessed against the conjunctival bleb that is space (space), bleb height (Height) and bleb vascularity. Space bleb was assessed by comparing the maximum space of the bleb (bleb peripheral edges) compared to the total space of peak conjunctival bleb or demarcation of the sclera flap below and rated using number 1 to 5, that is, 1 = 0% (failed bleb formation), 2 = 25%, 3 = 50%, 4 = 75% and 5 = 100%. Define the edges of the bleb is to look at the elevation the conjunctival blood vessels upon the episclera blood vessels. Determining the height of the bleb is by comparing the reference of the height of bleb photography by observing the midpoint as the culmination of a bleb, and rated from 1 to 4. The value of bleb vascularity starts from mid-peripheral edge of bleb, compared with conjunctival bleb reference photography and assessed 1 = avascular, 2 = normal vascularization, 3 = mild inflammation vascularization, 4 = moderate inflammatory vascularization and 5 = severe inflammation vascularization (Healey, PR, Trope, GE 2005).



Bleb Photograph Grading System Courtesy of Paul R. Healey, Graham E. Trope. The Failing bleb: Risk Factors and Diagnosis. Glaucoma Surgery.)

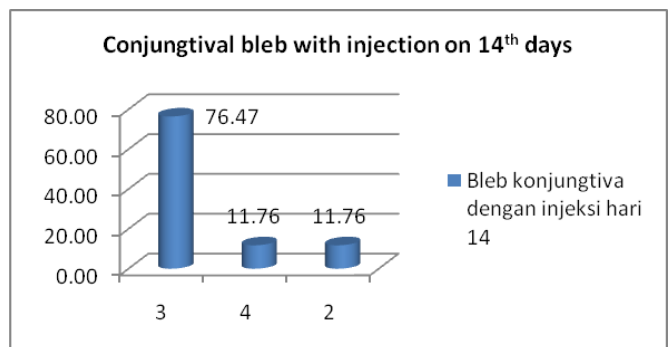
Result : showed vascularisation on 1st day

Graphic 1 : Bleb vascularisation on 1st day with bevacizumab injection



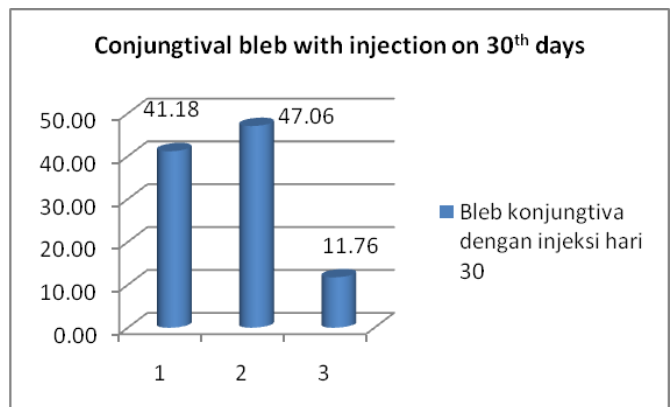
Graphic 1 showed on 1st day with bevacizumab injection vascularisation according to MBGS were moderate (4) as much as 23,53 %, severe vascularization (5) as much as 35,29 % and mild vascularisation (3) as much as 41,18 %.

Graphic 2 Bleb vascularisation on 14th days with bevacizumab injection



Graphic 2 showed on 14th days with bevacizumab injection according to MBGS showed moderate vascularisation (4) as much as 11,76 %, mild vascularisation (3) as much as 76,47 % and normal vascularisation (2) as much as 11,76 %.

Graphic 3 Bleb vascularisation on 30th days with bevacizumab injection



Graphic 3 showed on 30th days with bevacizumab injection according to MBGS were mild vascularization (3) as much as 11,76 % and normal vascularization (2) as much as 47,06 % and avascular (1) as much as 41,18 %

DISCUSSION

According to MBGS criteria the vascularization that visible from 1st day, 14th days and 30th days so showed severe vascularization (5) as much as 17,66 % and avascular (1) as much as 21,2 %. On 14th days was showed much cases (76,5 %) in mild vascularisation

MBGS	Avasc (1)	Normal(2)	Mild(3)	Moderate(4)	Severe(5)
1 st day			41,2 %	41,2 %	17,6 %
14 th days		11,8 %	76,5 %	11,8 %	
30 th days	21,2 %	30,3 %	45,5 %	3 %	

CONCLUSION

Result of the study above showed clearly that anto_VEGF bevacizumab injection accelerating wound recovery process that was marked with decreasing of vascularization from the 1st day until becoming avascular on 30th days. The vascularisation that disappeared on 30th days (21,2 % avaskuler) showed that inflammation process was done. Cessation of inflammation process so that fibrosis's process as bleb's failure was done too.

SUGGESTION

Giving anti-VEGF injection on glaucomaoperation to maintain bleb's shape can be used as a main choice for selective cases, such as Diabetic Mellitus patients and younger patients that had risk to occur neovascularisation that could make a glaucoma operation failure which is trabeculectomy.

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