

Case Report

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Autoregression of Neovascularization of the Disc (NVD) and Neovascularization Elsewhere in the Retina (NVE) in Type I Diabetic Patient

Mahdi Almubarak

Medical Retina Consultant, Dhahran Eye Specialist Hospital, Dhahran, Saudi Arabia

ABSTRACT

Spontaneous resolution of NVD or NVE is very rare, to the best of our knowledge, only five cases reported in the literatures. In this paper we reported a case of spontaneous regression of NVD and NVE in fundus of type one young diabetic female patient with history of bariatric surgery 1 year prior to presentation. Patient was followed up for 2 years with stable clinical course and without developing any further DR and without receiving any treatment. we assumed that this autoregression of neovascularization could be related to her blood sugar control secondary to bariatric surgery. We noticed also all the previous reported five cases were young ages (31, 46, 27, 26 and 19). This suggest the possibility of difference in the pathogenesis of proliferative retinopathy between type I and type II. Further studies are needed.

*Corresponding author

Mahdi ALMubarak, Medical Retina Consultant, Dhahran Eye Specialist Hospital, Dhahran, Saudi Arabia, Tele: 966556522297; Email: drmahdi414@gmail.com

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Introduction

Neovascularization of the optic disc (NVD) and Neovascularization elsewhere in the retina (NVE) are one of the common dangerous complications of proliferative diabetic retinopathy that may lead to loss of vision due to vitreous haemorrhage or tractional retinal detachment if left untreated. Treatment of NVD or NVE commonly by pan retinal photocoagulation (PRP) or more recently by injection of intravitreal anti vascular endothelial growth factor (VEGF) [1]. Spontaneous resolution of NVD or NVE is very rare, only five cases have been documented in the literatures [2-4]. In this paper we would like to report a case of spontaneous regression of NVD and NVE in fundus of type one young diabetic female.

Case Presentation

32 years old female known case of type I diabetes for 15 years, presented to ophthalmology clinic in Dhahran eye specialist hospital, Dhahran, Saudi Arabia, with hx of floaters for 1 month. Other History unremarkable except for history of gastric bypass surgery one year prior to presentation.

On Examination

Visual acuity (VA): 20/20 OD, 20/20 OS, Intraocular pressure (IOP): 23 OD, 19 OS. All anterior segment structures within normal limit, no signs of uveitis and no neovascularization in the iris (NVI). Dilated fundus exam showed posterior vitreous detachment in both eyes with fibrous band and focal traction retinal detachment located nasally over the disc in the right eye and fibrous band without traction inferiorly in the left eye with inferior old organized vitreous haemorrhage in the left eye. (Figure 1). Fundus fluorescein angiography was done and showed area of capillary drop out with

no evidence of active NVD or NVE (figure 2). Patient denied any hx of uveitis or history of other vasculopathic risk factors other than diabetes. Also denied hx of any previous PRP or injection of anti VEGF. The patient diagnosed with autoregression of proliferative diabetic retinopathy and followed up for 2 years without receiving any PRP or intravitreal anti VEGF with same clinical picture without developing any further clinical signs of diabetic retinopathy and 20/20 vision in both eyes.

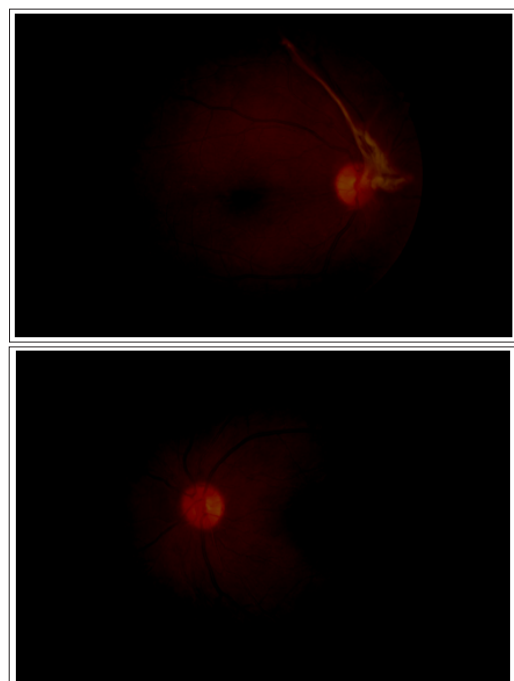
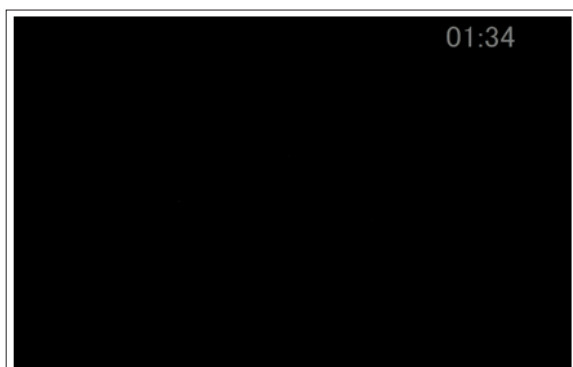


Figure 1: Fundus photo of both eyes



Discussion

Diabetic retinopathy classified into non proliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR). NPDR usually require no treatment, only observation with stress in glycemic control while PDR usually need treatment by laser photocoagulation to ablate the ischaemic retina or more recently by injection of intravitreal anti VEGF [1].

Spontaneous regression Of NPDR is not uncommon and have been documented before in the literatures with variable regression rates. The highest regression rate (24.12%) was found in a study that done in china about the regression of DR in type II diabetes and they founded that 110 patients out of 456 patients with DR

showed regression of their DR to grade 0 (no DR), those 110, 80 patients of them was grade 1 (mild NPDR) and 30 patients was grade II (moderate NPDR) and no patients with grade 3(sever NPDR) or grade 4 (PDR) showed any regression [2].

On the other hand, Spontaneous resolution of PDR is very rare, to the best of our knowledge, only five cases reported in the literatures. Jae Ryong Han et al, reported tow cases of young diabetic males in which NVD and NVE documented bilaterally based on clinical fundus examination and fundus fluorescein angiogram (FFA). Both patients received PRP in left eye and missed appointment for few months and they came back later with absence of NVD and NVE in both eyes without receiving any photo-coagulative effect in the right eye [3]. another retrospective study done in US by FRANCESCO BANDELLO and his colleagues reported a three cases of young type I diabetic females with spontaneous resolution of NVD and NVE without receiving any treatment [4].

In our patient we assumed that this autoregression of neovascularization could be related to her blood sugar control, as she was obese and her body weight was 109 kg and underwent gastric bypass surgery 1 year prior to presentation and her body weight at presentation was 83 kg and patient reported healthy lifestyle after that including diet control, blood sugar control and exercise. we reviewed her blood sugar readings and they were all controlled with Random blood sugar not more than 101mg/dl, normal range (80-140mg/dl) and haemoglobin A1C readings were 7%(which consider well controlled in diabetic patient) in each f/u visit.

The impact of the bariatric surgery on type II diabetic retinopathy has been studied by many authors and a conflicting evidence has been found. However, no study done in type I DM. Yong Joon Kim et al reported in his met-analysis regression of DR post bariatric surgery in 58 patients out of 243, 23.8% [5]. and when he compared between medical and surgical group, he found that post bariatric surgery group showed less progression in DR score compared to medical group (OR, 0.47;95% CI, 0.22 to 0.99; P=0.05) (15.4% versus 8.3%) respectively. Moreover, when he took the baseline status of DR in to consideration, he found that no significant difference in odds ratio (OR, 1.04;95% CI, 0.35 to 3.11; p=0.95) between patients who had pre-operative DR compared to those without DR preoperatively. On the other hand, another met-analysis done by Cheung D et al reported contraindicating result that patient with pre-operative DR at increased risk of worsening of their retinopathy post bariatric surgery [6].

Another met-analysis done in Italy by C. Merlotti and his colleagues suggested that bariatric surgery prevent incidence of developing new DR when compared to medical group [7]. A more recent matched cohort study found that bariatric surgery halves the incidence of overall microvascular complications of type II diabetes including retinopathy (7.2% in surgical group versus 11.2% in non-surgical group; HR: 0.55;95%CI: 0.42-0.73) after follow up period of 5 years [8]. A more longer duration of follow up was found in in another cohort study namely prospective Swedish obesity subjects (SOS) in which obese type II DM were followed up for 15 years after bariatric surgery and they found that incidence of microvascular complications including retinopathy were lower in bariatric surgery group when compared to control group (HR0.56,95% CI: 0.48-0.66) [9].

On the other hand, several studies documented that bariatric surgery did not change the DR score as the majority of the patients were stable [10-14]. Or even other studies revealed that bariatric

surgery associated with worsening of DR score secondary to raid blood sugar control so close f/u was recommended [6,15-18]. Factors that increase risk of progression were: severity of preoperative DR, post-operative Hb A1C, male gender and ethnicity [19, 20].

Lastly, tow reviews articles were done by Ricardo Cohen and by Dora M both reviews concluded that despite positivity or beneficial effect of bariatric surgery on DR, risk of DR after bariatric surgery is still there even after remission of diabetes, and DR cannot be predicted so baseline and close follow up examination was recommended (5, 21-23).

Comparing our patient to previously mentioned case report of self-regression of neovascularization. FRANCESCO BANDELLO and his colleagues reported no changes in the metabolic panel in those 3 patients during the duration of disappearance of the new blood vessels [4]. while Jae Ryong Han and his colleagues suggesting that this could be related to blood sugar control as both patients were having poor control of blood sugar at first visit and their blood sugar controlled after that [3]. Also, we noticed that all the previous reported five cases were young ages and, and the type of diabetes was type I in the three cases in US study but the type of diabetes was not mentioned in 2 cases of Korea study [19]. Our patient was also a young age 32 years and type I.

However, it is small number but This suggest the possibility of difference in the pathogenesis of proliferative retinopathy between type 1 and type II. However, no evidence of such difference in the literatures has been found. Tomić et al , found that systemic inflammation and obesity were associated with development of retinopathy in type II diabetes but not type I, suggesting that more researches are needed to identify the difference in the pathogenesis and therefore the difference in the treatment approach [24]. Another study done in china found that central opacity in type II DM increase the risk of DR (OR; 1.07, 95%CI). A meta-analysis was also done and they found that central opacity increases the risk of DR by 12% (OR;1.12, CI 955) interestingly, they found that there was strong association between BMI and PDR (OR0.95, CI 95%) [25].

Conclusion

Autoregression of PDR is very rare, in this case we believe that it is related to good glycemic control after bariatric surgery. We noticed that this case and five previous reported cases were young ages. So further studies are needed to study the effect of bariatric surgery in obese type I diabetics on DR. and the possibility of difference in the pathogenesis of DR between type 1 and II.

Statement of Ethics

Consent has been obtained from the patient for the purpose of using her clinical information and pictures of investigation for print or online publication.

Disclosure Statement

The authors have no conflicts of interest that are directly relevant to the content of this paper. No sources of funding were used to assist in preparation of this paper.

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