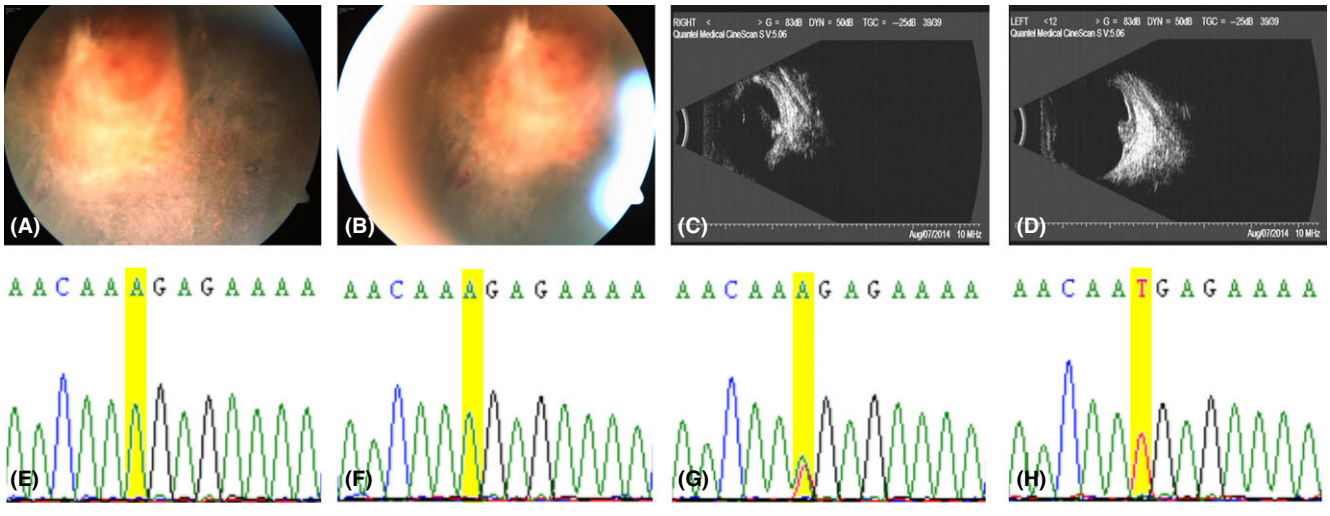

Fig. 1. Fundus exam revealed retina detachment and absence of retinal vascular in the left eye (A, B); Ultrasound B-scan showed complete retinal detachment in the right eye and tractional retinal detachment in the left eye (C, D); Partial nucleotide sequences of exon 2 of the *NDP* gene of the elder brother and the younger brother showed a hemizygous variant at nucleotide position c.2 T>A, resulting in a missense mutation p.Met1Lys (E, F). Their mother was heterozygous for this mutation (G). But the mutation was absent in their father (H).

Over 100 mutations have been identified, and the severity and classification of disease correlate approximately with genotype. In this case, we found a novel mutation c.2T>A in exon 2 responsible for ND resulting in a missense mutation. The mutation affecting the initiation codon produced an AAG codon, which could not initiate translation. As the translation start site and its context sequence play an important role in the control of translation efficiency and the correct translation of mRNA, the c.2T>A mutation is expected to cause the failure of the start of ND gene translation or the production of an aberrant protein. Previous reported initiation codon point mutations, c.1_2delAAT, c.2_3delTG, c.1A>G (p.Met1Val) and c.2T>G (p.Met1Arg), have been reported to be responsible for ND (Isashiki et al. 1995; Schuback et al. 1995; Caballero et al. 1996; Zhang et al. 2013). All these patients have congenital blindness. The patients with c.1_2delAAT, c.2_3delTG and c.1A>G mutation remained unremarkable in ontological and neurological studies, while the patient with c.2T>G mutation had hearing loss and autistic features. In this case, both hearing problems and mental retardation were absent in two patients. We suppose that the differences in the mutations and the subsequent differences in the translation efficiency and aberrant protein products may contribute to the differences in clinical manifestation.

In summary, we reported a novel missense *NDP* mutation of a familial case of ND in a Chinese family.

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Sneddon's syndrome with optic disc macroaneurysm and macular edema successfully treated with subtenon steroid injection

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Editor,

Here, we report a patient with Sneddon's syndrome who developed optic disc macroaneurysm and resulting macular oedema, which was successfully treated with a posterior subtenon injection of triamcinolone acetonide (STTA).

In March 2014, a 48-year-old man with impaired central vision and image distortion in his right eye was referred to the Medical Retina Division Clinic of Department of Ophthalmology, Keio University Hospital (Tokyo, Japan). His right fundus showed optic disc macroaneurysm (Fig. 1A, arrow) and macular oedema with hard exudates. His visual acuity (VA) was 1.0 in decimal VA (0 in logMAR) at the first visit. Fundus fluorescein angiography (FFA) showed delayed perfusion in an inferotemporal branch retinal artery (arm to the branch perfusion time, 31 seconds; Fig. 1B, arrowheads) and optic disc macroaneurysm at the beginning of the branch artery (Fig. 1B and C). He had a history of recurrent inferotemporal branch retinal artery occlusion (BRAO) from August 2012. He had been diagnosed with Sneddon's syndrome based on the characteristic livedo reticularis (Fig. 1D), labile hypertension and stroke (Fig. 1E, arrowheads) (Sneddon 1965) at Department of Internal Medicine in November 2012. He showed a high serum anticardiolipin antibody level and was treated with warfarin, aspirin, prednisolone (5 mg/day) and a hypotensive drug.

Optical coherence tomography (OCT) revealed cystic macular oedema and subfoveal serous retinal detachment and resulting increased central retinal thickness (CRT, 467 μm, Fig. 1F). OCT of the optic disc revealed lumen of the optic disc macroaneurysm (Fig. 1G, arrowheads). Three months following STTA administration (20 mg), the subfoveal fluid had disappeared, and CRT had reduced to 200 μm. An additional STTA was performed 5 months after the initial injection to treat the residual macular oedema around the optic disc. Twelve months after the first STTA, the exudative changes had resolved (Fig. 1H), and the optic disc macroaneurysm had regressed [Fig. 1I (arrowheads) and J].

Ultrastructural analysis of skin biopsy in Sneddon's syndrome has revealed a reduction in the capillary lumens due to proliferation of endothelial cells and basement membrane (Lewandowska et al. 2005). Sixty per cent of patients have antiphospholipid antibodies suggesting the involvement of inflammatory processes (Stockhammer et al. 1993). Therefore, this syndrome carries a risk of vascular occlusion. In fact, among the rarely reported cases of ocular manifestations of Sneddon's syndrome, six of eight reported cases exhibited retinal artery occlusion (Jonas et al. 1986), and one showed retinal vein occlusion (Aggermann et al. 2007). Our case also included a history of BRAO. However, the current episode was a secondary complication of macroaneurysm, and this is the first case of Sneddon's syndrome associated with retinal macroaneurysm. The distinct vascular wall abnormality with thrombosis related to antiphospholipid antibodies could have induced the aneurysm formation. Moreover, BRAO could have been related to the macroaneurysmal turbulent flow; however, no FFA recordings were performed at the first onset of BRAO.

Retinal macroaneurysms usually occur in patients aged over sixty with hypertension and unilaterally. They affect the major arterial branches posterior to the equator but are rarely (only 5%) found in the peripapillary region. Our case was atypical in terms of age, sex and aneurysm location. This may be because his aneurysm was related to the vascular changes specific to Sneddon's syndrome. In this case, STTA successfully resolved macular oedema and significantly regressed the macroaneurysm, suggesting the involvement of inflammatory processes in his pathogenesis. This is consistent with the evidence that systemic corticosteroid treatment is beneficial for antiphospholipid antibody-positive Sneddon's syndrome affecting various organs.

In conclusion, here we report the first case of optic disc macroaneurysm with macular oedema as an ocular complication of Sneddon's syndrome and its successful treatment with local steroid injection.

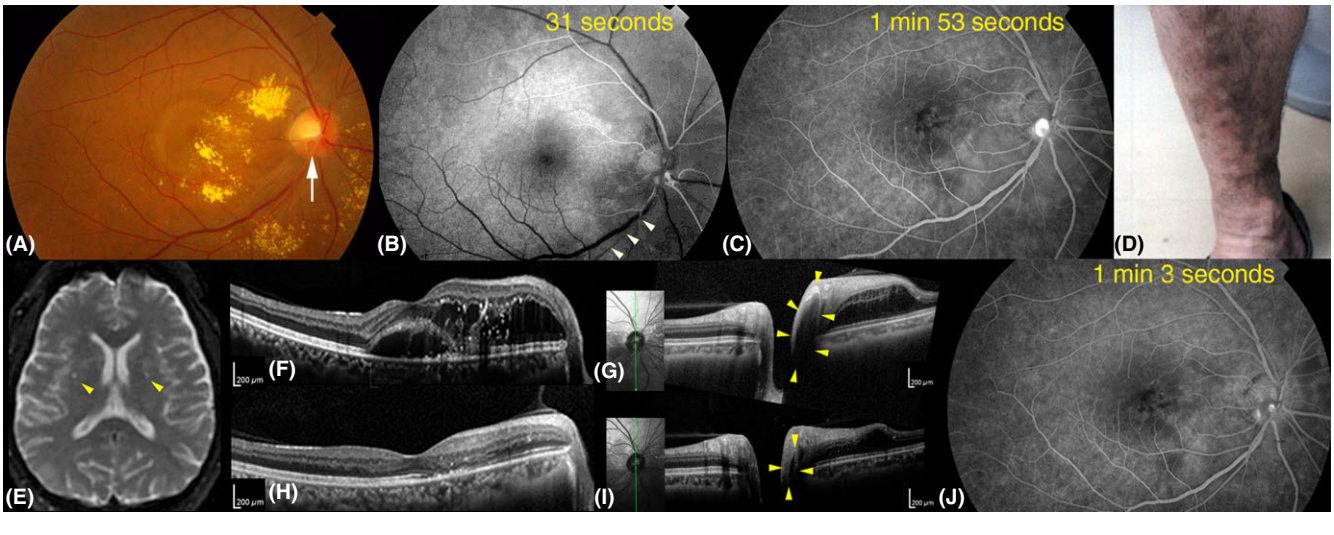

Fig. 1. (A) Fundus photograph at first visit. Exudative changes including subretinal fluid and hard exudates were found around the aneurysm (arrow) located close to the optic disc. (B, C) Fundus fluorescein angiography (FFA) before the first subtenon steroid injection (STTA). (B, arrowheads) The inferotemporal branch artery showed delayed perfusion and (C) optic disc aneurysm was clearly observed. (D, E) Systemic findings of Sneddon's syndrome. (D) Livedo reticularis of the lower leg and (E, arrowheads) T2 magnetic resonance imaging (MRI) brain scan showing multiple ischaemic lesions. (F–I) Optical coherence tomography (OCT). (F) Subfoveal fluid, retinal oedema and (G, arrowheads) lumen of the optic disc aneurysm were recorded before the initial STTA. (H) OCT showed that exudative changes were resolved and (I, arrowheads) aneurysm lumen was regressed, 12 months after initial STTA. (J) FFA also visualized the diminished aneurysm size 12 months after initial STTA.

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Autofluorescence-delineated macular hole size predicts postoperative visual outcome

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Editor,

Optical coherence tomography (OCT) parameters have been used to predict postoperative vision after macular hole (MH) surgery (Ullrich et al. 2002; Kusuhara & Negi 2014). We hypothesized that the measurement of the brightest area on fundus autofluorescence (FAF) images may also have a good correlation with postoperative visual acuity. We retrospectively collected 52 eyes from 52 consecutive patients with sealed idiopathic MH after vitrectomy was performed by a single surgeon. From preoperative multiple horizontal or vertical OCT scanning images, the one with the widest MH base was selected, and two parameters were measured: the minimum diameter, defined as the shortest distance across the full-thickness defect, and the base diameter, defined as the base length of the MH (Fig. 1A).

Fundus autofluorescence imaging was performed using a confocal scanning laser ophthalmoscope before surgery. The MH size measured based on the brightest area of the FAF was termed the autofluorescence area (AFA) and was measured by the following steps: first, the brightest FAF area was outlined manually five times; the delineated area was measured each time using the ImageJ software and averaged. Second, a square was made five times out of the 200-μm scale line at the left lower corner of the FAF image, and the average of the 5 square area measured was obtained using the ImageJ software. Third, the figure from the first step was divided by the figure from the second step; the result was multiplied by 40 000 μm^2 to obtain the AFA (Fig. 1B).

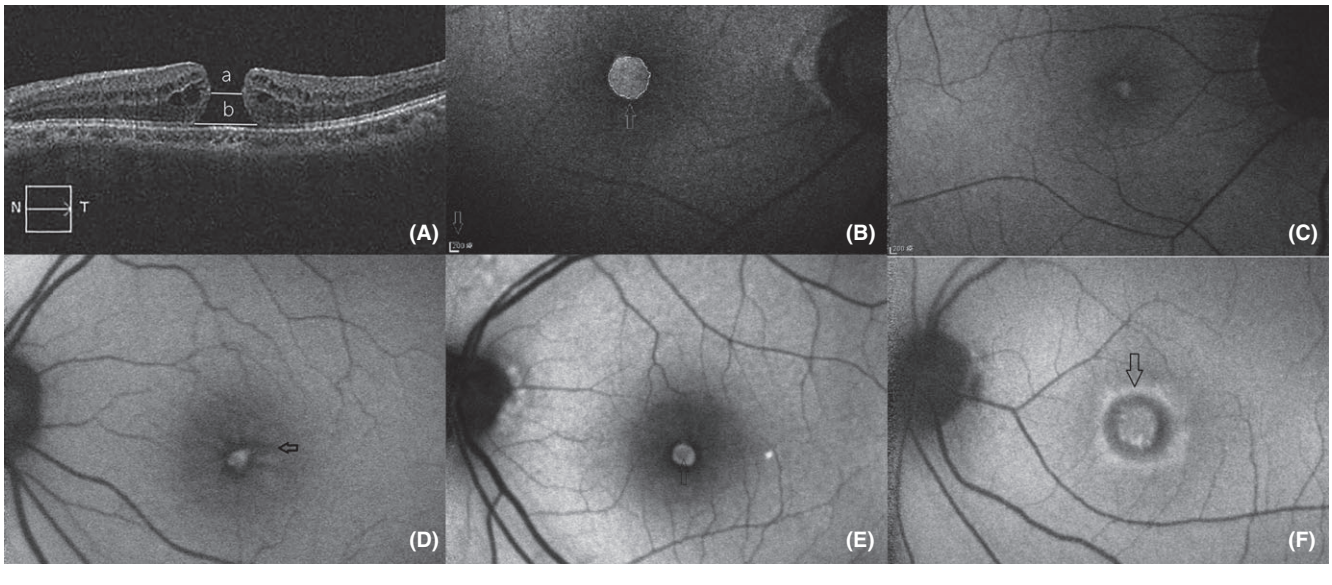

Fig. 1. Size measurement (A–B) and different patterns of fundus autofluorescence (FAF) in macular hole (MH) (C–F). (A) Optical coherence tomography (OCT) of a MH. a: minimum diameter; b: base diameter. (B) Macular hole with circular hyperfluorescence in FAF image. The brightest area of central hyperfluorescence (central arrow) was measured using the square based on the scale shown in the corner (corner arrow). (C) An example of irregular shape of hyperfluorescence in FAF image. (D) MH with a stellate appearance and dark radiating striae (arrow) in FAF image. (E) MH with central darkness (arrow) in FAF image. (F) MH with an outer ring-shaped hyperfluorescence encircling the central round hyperfluorescence and a ring of relative hypofluorescence area (arrow).