



THERAPEUTIC PLASMA EXCHANGE IN A PATIENT WITH ADVANCED EXUDATIVE RETINOPATHY SECONDARY TO HYPERTRIGLYCERIDEMIA

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Clinical History

- 56 year old female with long-term diabetes on insulin
- Poorly controlled hypertriglyceridemia
- Multiple prior admissions for hypertriglyceridemic pancreatitis
- Hypertension
- Obesity



Clinical History

- Dyslipidemia poorly controlled despite aggressive medical management:
 - Vytorin (Ezetimibe/Simvastatin)
 - Tricor (fenofibrate)
 - Lantus/Humalog
 - Glucophage (Metformin)
 - Niacin
 - Omega-3 Fatty Acids
 - (Discontinued: Fish Oil)



Laboratory values

- Pre-TPE
 - Triglyceride 1450 mg/dL (historically >20,000)
 - Total Cholesterol 276 mg/dL
 - HDL 37 mg/dL
 - Non-HDL 239 mg/dL
 - TC:HDL 7.5

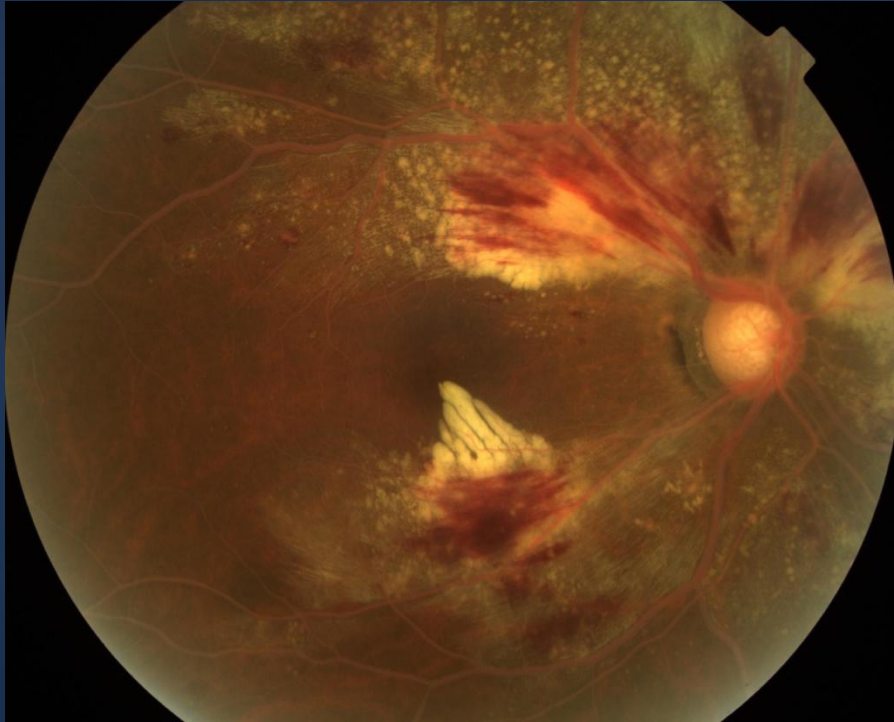


Referred By Ophthalmology

- Advanced exudative retinopathy (secondary to lipemia)
- **Impending central vision loss**
- Intravitreal injections with Bevacizumab (anti-vascular endothelial growth factor)
- Evaluate for Plasma exchange therapy



Referred By Ophthalmology



Right Eye



Left Eye



Is TPE an appropriate therapy in this patient?



ASFA Guidelines 2010

Therapeutic Apheresis—Guidelines 2010 121

HYPERTRIGLYCERIDEMIC PANCREATITIS

Incidence: 18 per 100,000/year

Procedure
TPE

Recommendation
Grade 2C

Category
III

of reported patients*:100-300

RCT	CT	CS	CR	Type of evidence
0	1 (29)	12 (132)	28	Type II-1



ASFA Guidelines 2010

Volume treated: 1 to 1.5 TPV

Frequency: Therapeutic: daily for one to three days depending upon patient course
Prophylactic: every 2 to 4 weeks to maintain TG level below 150 mg/dL

Replacement fluid: albumin; plasma

Duration and discontinuation/number of procedures

For patients with acute pancreatitis, one TPE has been sufficient to improve the patient's clinical condition and lower their TG levels with additional treatments if necessary. For patients treated prophylactically, chronic therapy for years has been reported.



Stefanutti et al (Artif Organs 2009)

TABLE 1. Patient demographics and clinical characteristics

Center	Patient number	Sex		Age* (46 ± 10)	BMI† (24 ± 3)	Lipoprotein phenotype	Associated disease	No. of TPE sessions (n = 217)
		F (n = 8)	M (n = 9)					
A	1	F		60	22	III	AP; CHD, AMY	31
	2	F		55	24	V	AMY	2
	3	M		44	25	IV	CHD	2
	4	M		60	24	V	CHD	3
	5	F		42	25	IV	AP	10
	6	M		42	27	V	AP	6
	7	F		44	22	III	AP	46
B	8	F		64	22	IV	AP; CHD	17
	9	M		33	23	V	AP	14
	10	F		43	21	IV	GLYG	10
	11	M		56	20	IV	AP; ARI	23
	12	M		43	20	V	AP	3
C	13	M		36	29	IV	AP; ARI	20
	14	M		41	30	V	AP	2
D	15	F		51	29	V	AP	22
	16	M		55	28	IV	AP	2
	17	F		25	25	V	AMY	4

* Years ± SD.

† BMI, body mass index (kg/cm² ± SD).

AP, acute pancreatitis; CHD, congestive heart disease; AMY, amyloidosis; GLYG, glycogenosis; ARI, acute renal insufficiency.



Cusick et al (j. ophthal 2003)

- 48 year old man with dyslipidemia and worsening macular edema and retinal hard exudates
- Vision worsened despite aggressive medical management of dyslipidemia and focal laser photocoagulation
- Plasmapheresis initiated: patient received 2 complete and 8 half sessions over 2 weeks



Cusick et al (j. ophthal 2003)

Cusick et al • Serum Lipids and Retinal Hard Exudates in Diabetic Retinopathy

Table 2. Case 2: Patient Characteristics during Follow-up

Parameter	Date of Examination			
	January 30, 1997	October 13, 1998	January 8, 2001	February 21, 2001
Visual acuity, right eye	20/20	20/30	20/25-1	20/25-2
Visual acuity, left eye	20/20	20/25	20/200	20/100-1
Hard exudate	Absent	Absent	Severe	Decreased
Total cholesterol (mg/dl) (mmol/l)	—	262 (6.8)	492 (12.7)	165 (4.3)
HDL (mg/dl) (mmol/l)	—	58 (1.5)	40 (1.0)	23 (0.6)
Triglycerides (mg/dl) (mmol/l)	—	656 (7.4)	908 (10.3)	506 (5.7)
Blood glucose (mg/dl) (mmol/l)	—	537 (29.8)	143 (7.9)	—
Blood urea nitrogen (mg/dl) (mmol/l)	—	33 (11.8)	48 (17.1)	62 (22.1)
Serum creatinine (mg/dl) (umol/l)	—	1.1 (97)	1.7 (150)	2.6 (230)
Serum albumin (g/dl) (g/l)	—	3.2 (32)	3.8 (38)	—

HDL = high-density lipoprotein.

Laboratory tests that were not performed on a given date of examination are represented by a dash.

*This clinical examination was performed after plasmapheresis treatments over the course of 2 wks to decrease serum lipids.



TPE Series Performed

- Total of 13 plasma exchanges
- One plasma volume per procedure, replacing 100% of removed volume with 5% albumin.
- Three exchanges per week for the first two weeks.
- Tapered therapy to once per week



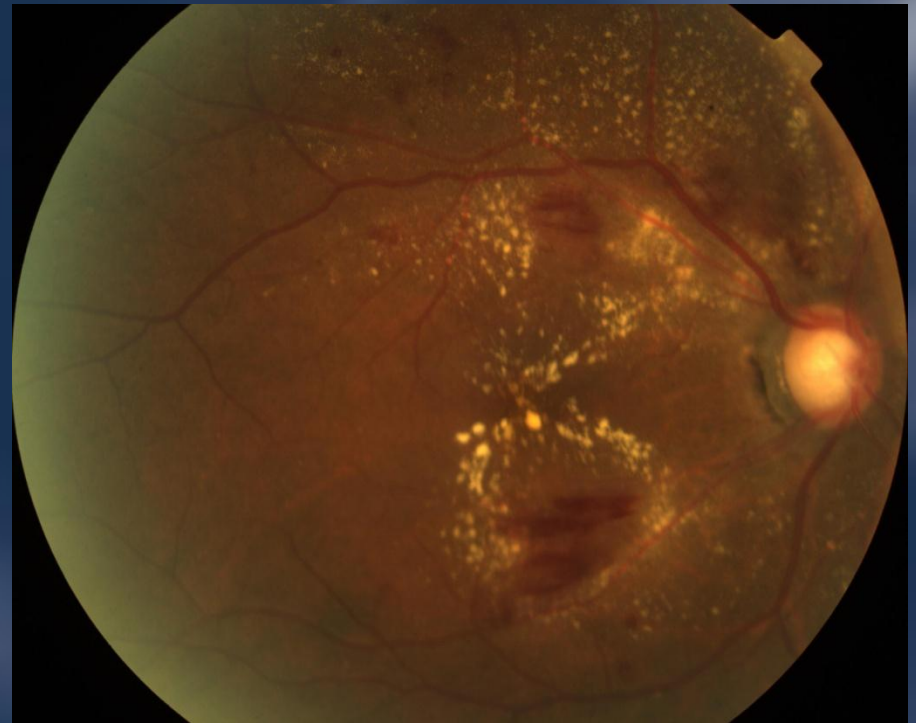
Results

- Improvement in visual symptoms (subjectively and by acuity testing) and fundoscopic exam findings



Right eye-TPE

Right eye- post #8





Left eye pre-TPE

Left eye-post #8





OCT Scan Pre and Post TPE

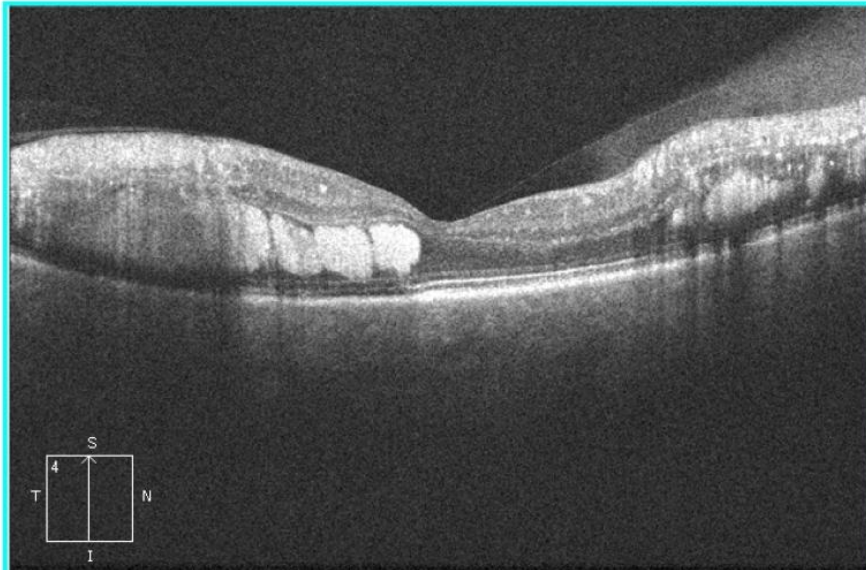
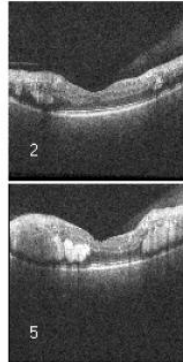
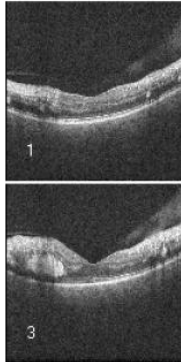
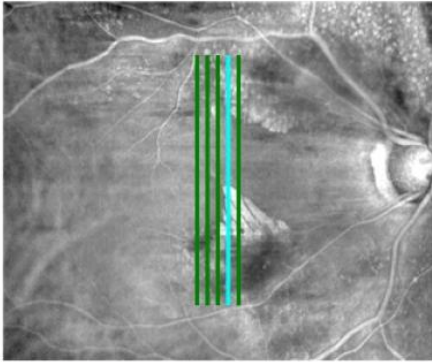
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OD OS

Scan Angle: 90°

Spacing: 0.25 mm

Length: 6 mm



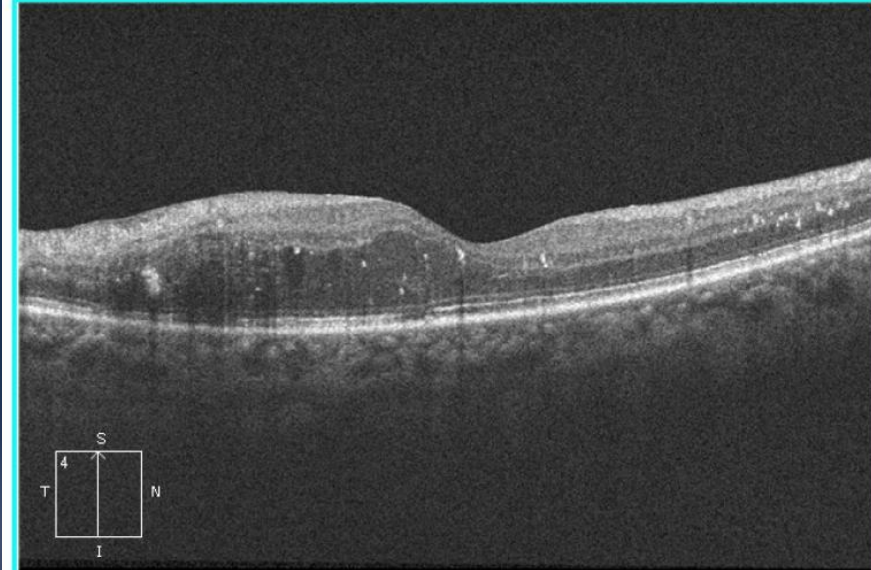
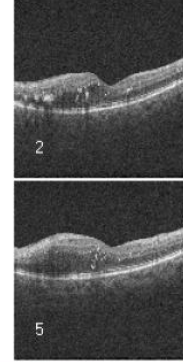
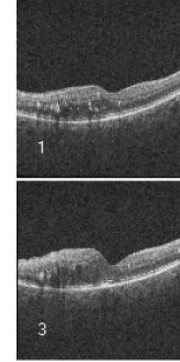
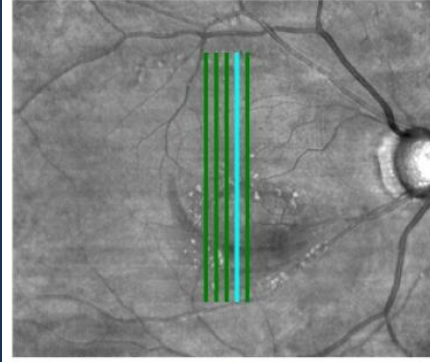
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Results

	Pre-TPE	Pre-TPE3	Pre-TPE6	Post TPE10	Pre/Post TPE11	Pre/Post TPE12	Pre TPE13
Triglyceride	1450	577	1320	261	*606/273	1164/543	*755
Total Chol	276				189/83		
HDL	37				29/15		
Non-HDL	239				160/68		

* Fasting



Discussion

- TPE is currently a category III (grade 2C) treatment for hypertriglyceridemic pancreatitis.
- The current case and a previously reported case have demonstrated efficacy in treating retinopathy secondary to dyslipidemia with hypertriglyceridemia (category III?)
 - If maximal medical therapy has failed, this seems to be a viable option if otherwise appropriate.



Discussion

- The optimum treatment duration for the treatment of hypertriglyceridemia is not well established.
- Our case and previous studies have shown significant reductions in HDL with TPE.
- Dietary and drug treatment must be carefully combined with apheresis.
- Follow-up: Our patient is alive and continues to receive aggressive medical management.





References

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