EXUDATIVE RETINAL DETACHMENT

Eye Learn

All about the Eye

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Exudative retinal detachment

1. Mention a differential diagnosis of various etiologies of exudative retinal detachment. 5 October 2017 FAT
2. Etiopathogenesis and management of exudative retinal detachment. 5+5 D2017

I. ALTERATIONS IN CHOROIDAL FLOW

1. Idiopathic Central Serous Chorioretinopathy (ICSC)
2. Idiopathic polypoidal choroidal vasculopathy
3. Tumors of the Choroid and Retina
   - i. Choroidal melanomas
   - ii. Choroidal nevi,
   - iii. Choroidal hemangiomas,
   - iv. Choroidal metastasis
     - ➢ Breast adenocarcinoma in females
     - ➢ Lung adenocarcinoma in males
   - iv. Retinoblastoma,
     - ➢ Endophytic growth

4. Systemic Disease with Disrupted Choroidal Blood Flow
   - i. Malignant hypertension,
   - ii. Disseminated intravascular coagulation (DIC),
   - iii. Thrombotic thrombocytopenic purpura (TTP),
   - iv. Renal failure,
   - v. Preeclampsia.

5. Vasculitis and Autoimmune Disease
   - i. Systemic lupus erythematosus (SLE),
   - ii. Wegener's granulomatosis,
   - iii. Polyarteritis nodosa,
   - iv. Relapsing polychondritis,
   - v. Dermatomyositis,
   - vi. Goodpasture's disease

II. POOR SCLERAL OUTFLOW

1. Nanophthalmos
2. Uveal Effusion Syndrome
3. Posterior Scleritis
4. Orbital cellulitis
5. Lyme disease
6. Cat scratch disease

III. BREAKDOWN OF THE RPE AND RETINA

1. Inflammatory
   - i. Vogt-Koyanagi-Harada Disease,
   - ii. Sympathetic Ophthalmia
   - iii. Sarcoidosis

2. Infectious Diseases
   - i. Toxoplasmosis
   - ii. Syphilis
   - iii. Cytomegalovirus (CMV)
   - iv. Lyme disease (Borrelia burgdorferi),
   - v. Tuberculosis,
   - vi. Histoplasmosis,
   - vii. Coccidiomycosis,
   - viii. Cryptococcus
   - ix. Cat scratch disease (Bartonella henselae)

3. Retinal Vascular Diseases
   - i. Coats' disease,
   - ii. Familial exudative vitreoretinopathy (FEVR),
   - iii. Retinal angiomatosis.
     - ➢ Capillary hemangiomas of the retina can be seen in isolation (von Hippel disease),
     - ➢ In association with systemic tumors, such as central nervous system (CNS) hemangioblastomas
     - ➢ Renal cell carcinoma (von Hippel-Lindau disease)

IV. MISCELLANEOUS

1. Multiple myeloma/immune gammopathies/paraproteinemias
2. Post-surgical
   - i. Post-retinal reattachment surgery
   - ii. Post-laser therapy
   - iii. Post-cryotherapy

3. Medication related: IFN/ribavirin
4. Congenital optic nerve anomalies (optic pit, coloboma, morning glory)
5. Bilateral diffuse uveal melanocytic proliferation (BDUMP)

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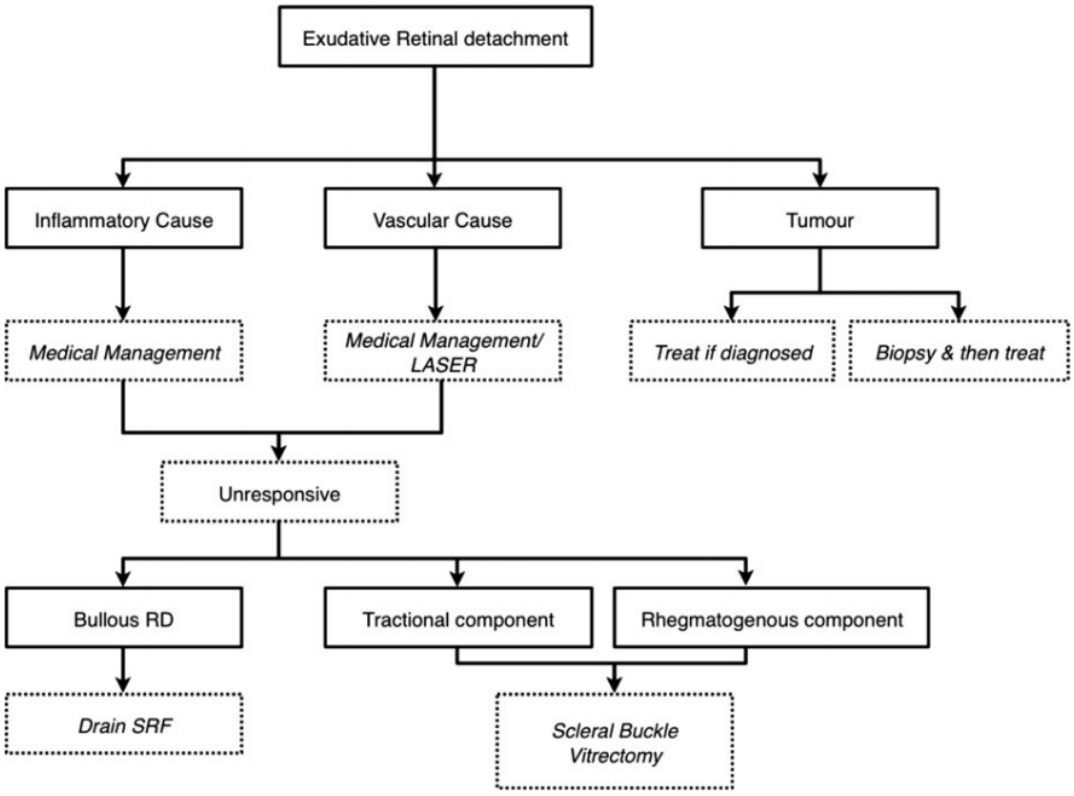

A. Simple observation	CSC
B. Medical management	
1. Antibiotic therapy	Retinal and choroidal infections, orbital cellulitis, infectious posterior scleritis Exudative detachments can occur after endophthalmitis or choroidal abscess
2. Systemic immunosuppression	VKH, Posterior scleritis, vasculitides, autoimmune disease, idiopathic frosted branch angiitis
3. Chemotherapy	Choroidal neoplasms, multiple myeloma, and BDUMP
C. Intravitreal injection	
1. Anti-VEGF therapy	Exudative ARMD, Coats' disease, ROP and choroidal melanomas and hemangiomas, IPCV
2. Intravitreal and peribulbar steroids	Inflammatory diseases.
D. Laser treatment	
1. Laser photocoagulation	Coats' disease, capillary hemangiomas, Von Hippel–Lindau disease ICSC not resolving spontaneously, focal laser can be applied to sites of RPE leakage that are sufficiently distant from the fovea. IPCV Laser can also be applied to well-circumscribed choroidal hemangiomas
2. PDT	Diffuse choroidal hemangioma, Von Hippel–Lindau disease ICSC (half- and minimal-fluence treatments) , IPCV
3. Cryotherapy	VHL, Coats
E. External beam radiotherapy	Indicated for more diffuse choroidal hemangiomas lesions
F. Surgery	
1. Sclerotomy	UES, Nanophthalmos
2. SRF drainage + RD SX	i. In occasional cases of **inflammatory disease or ICSC**, especially with long-standing bullous detachments ii. Vitrectomy may be required to treat **breakthrough vitreous hemorrhage in IPCV** in conjunction with anti-VEGF to settle the exudative element. Gas tamponade helps in displacement of subretinal bleeds in these patients with or without the use of tissue plasminogen activator iii. A successful surgical treatment (vitrectomy) for **bilateral bullous retinal detachment in VKH disease** is reported. SRF drainage is attempted in chronic, non-responsive bullous retinal detachments

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	iv. The surgical approach is contemplated at **stages 3 and 4 Coats**. SRF drainage attempted in combination with cryotherapy for bullous peripheral detachments v. **Diffuse choroidal hemangioma with bullous RD**, resistant to conventional therapy with external drainage of SRF along with intraoperative transpupillary thermotherapy with good control of tumour and resolution of SRF. vi. Peripheral tractional detachment can occur following laser/ cryotherapy in **VHL** and can be treated with scleral buckling.

Surgical options for drainage of subretinal fluid (SRF)

External approach	Internal approach
1. Scleral cut down and choroidotomy ➢ Needle opening of choroid ➢ Laser opening of choroid 2. Needle aspiration 3. 26-G trocar and cannula drainage by retraction	1. Pars plana vitrectomy with endodrainage through a drainage retinotomy, endolaser/cryopexy and tamponade with gas /silicon oil. 2. Pars plana vitrectomy with liquid perfluorocarbon assisted external drainage. 3. Pars plana approach endolaser without vitrectomy.

- Steve Charles technique of needle drainage is a relatively safer procedure can be combined with Chandelier illumination offers the comfort of using BIOM with the hands free for drainage of SRF under direct visualization and also allows surgeon to withdraw needle as the retina flattens avoiding complications like retinal incarceration, subretinal hemorrhage and vitreous loss.
- Continuous monitoring with indirect ophthalmoscopy during the drainage has also been reported to be free from complications.
- Subretinal aspiration and injection device (SA-AID) introduced by Kang et al to facilitate controlled external drainage of SRF.
- This device provides a safe approach to the subretinal space because it penetrates the eye wall obliquely and allows a changeable, predetermined length of the needle tip.
- The surgeon can also directly observe the retina with an indirect ophthalmoscope during the drainage.
- External drainage done for bullous RD in periphery
- If using needle, bevel down will avoid retinal aspiration.
- Choroidotomy opening and needle can get occluded by sub retinal fibrin/cholesterol.
- AC maintainer may help for near complete drainage in selected situations.

Management of specific cause

1. **Central serous chorioretinopathy**
i. CSCR usually is treated well with photodynamic therapy/laser/ micro pulse diode laser. ii. Exudative detachment usually occurs due to a RPE rip which may heal in few months. iii. All precipitating factors should be treated before resorting to surgical treatment iv. External drainage performed with 26-G needle (Steve Charles technique). v. Chandelier-assisted internal approach by PPV with scleral buckle **vi.** Use of liquid perfluorocarbon in a procedure which combined both PPV and external drainage when SRF was present posteriorly. **vii.** Liquid perfluorocarbon was used to attach the posterior retina while the SRF was drained via the external drainage and then applied diode laser to the area of leak
2. **Diffuse choroidal hemangioma**
i. Conventional therapy includes photodynamic therapy, external beam radiation therapy and oral propranolol. **ii.** Shanmugam et al.in their unpublished data have treated a patient with diffuse choroidal haemangioma with bullous RD, resistant to conventional therapy with external drainage of SRF along with intraoperative transpupillary thermotherapy with good control of tumour and resolution of SRF.

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3. **Uveal effusion syndrome**

Since increased thickness of the sclera was preventing the trans-scleral diffusion, partial thickness sclerotomies would help in successful reabsorption of subretinal fluid.

4. **Posterior microphthalmos (PM)**

The most common treatment performed is full-thickness sclerectomies to provide an exit for choroidal fluid

5. **Coats' disease**

i. Multiple modalities have been employed to treat including diathermy, laser photocoagulation, cryotherapy, SRF drainage; scleral buckling surgery, pars plana vitrectomy and intravitreal anti-vascular endothelial growth factor (VEGF) therapy.
ii. Laser is the main stay of treatment in Coats disease.
iii. Treatment is aimed at destroying abnormal vasculature and aneurysmal dilations.
iv. The surgical approach is contemplated at stages 3 and 4 as serous bullous retinal detachment that does not permit regular laser ablation or transconjunctival cryopexy of retinal vessel telangiectasias
v. SRF drainage attempted in combination with cryotherapy for bullous peripheral detachments.
vi. The aim of SRF drainage is to prevent phthisis or painful blind eye and not visual gain.
vii. Retinotomy should be avoided and endodrainage should be performed in cases of combined retinal detachment with signs of chronicity.

6. **Vogt–Koyanagi–Harada syndrome**

i. Chronic VKH can be differentiated from CSCR by a course of steroids and improvement with no worsening.
ii. Control of inflammation is the mainstay of treatment.
iii. The conventional treatment includes control of inflammation by regional, oral and intravenous corticosteroids, cyclosporine, antimetabolites and alkylating agents.
iv. A successful surgical treatment (vitrectomy) for bilateral bullous retinal detachment in a patient with VKH disease is reported.
v. SRF drainage is attempted in chronic, non-responsive bullous retinal detachments like in Coats disease.
vi. Recurrences are common

7. **Von Hippel–Lindau disease**

i. Treatment modalities are observation, laser photocoagulation, transpupillary thermotherapy, cryotherapy, photodynamic therapy, plaque radiotherapy and proton therapy.
ii. ERD in VHL can occur due to retinal capillary haemangioma itself or secondary to treatment of retinal capillary haemangioma
iii. Peripheral tractional detachment can occur following laser/ cryotherapy and can be treated with scleral buckling.
iv. Occurrence of iatrogenic retinal breaks should be prevented while performing vitrectomy in bullous retinal detachments.
v. Absence of posterior vitreous detachments and presence of thick fibrous sheets is challenging. Uncontrollable bleeding.
vi. Endocryotherapy can be used to treat vascular lesions

8. **ERD in retinopathy of prematurity**

treated with intravitreal bevacizumab, laser ablation and scleral buckling, resulting in resolution of the exudation and detachment

9. **Posterior scleritis**

can be managed with anti-inflammatory agents or anti-infective therapy based on proper diagnosis

10. **Exudative detachments can occur after endophthalmitis or choroidal abscess**

Control of infection is the mainstay of treatment.
Therapeutic and diagnostic vitrectomies may be required for proper medical management.

11. **Idiopathic polypoidal choroidovasculopathy**

Exudative detachments can and anti-VEGFs are the mainstay of treatment.
Vitrectomy may be required to treat breakthrough vitreous haemorrhage in conjunction with anti-VEGF to settle the exudative element.
Gas tamponade helps in displacement of subretinal bleeds in these patients with or without the use of tissue plasminogen activator

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12. **Post glaucoma filtration surgeries**
Exudative detachments can present with choroidal detachments following sudden decompression of globe in glaucoma filtration surgeries and can be managed medically similar to exudative RD following laser or cryotherapy
13. **Masquerade syndrome**
can present with exudative detachments of retina, and choroid and malignancy (primary or secondary) should be excluded before resorting to any surgery

Causes of exudative retinal detachment

Choroidal causes:	**Retinal causes:**
a. Idiopathic choroidal vascular hyperpermeability- CSCR b. Localized choroidal vascular hyperpermeability- Choroidal hemangioma c. Tumours of choroid - Choroidal melanoma d. Impaired outflow through sclera- Uveal effusion syndrome e. Inflammatory conditions of choroid and sclera VKH syndrome Sympathetic ophthalmitis Posterior scleritis f. Ischemia and altered choroidal hyperpermeability Preeclampsia, malignant hypertension, disseminated intravascular coagulation, idiopathic polypoidal choroidal vasculopathy	a Retinal angiomatosis b Coats' disease c Retinal venous occlusive disease d Retinal artery macroaneurysm e Idiopathic frosted branch angiitis
	Miscellaneous causes:
	a Post-retinal reattachment surgery b Post-laser therapy c Post-cryotherapy

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