I

INTRODUCTION AND AIM OF THE RESEARCH.

Every ophthalmologist who has attempted to treat the intraocular haemorrhage realizes the challenge and potential danger of this serious condition.

The solution to the perplexing problem of managing the intraocular haemorrhage has not yet been found is emphasized by the multitude of therapeutic approach to this enigma.

This work is a trial to study this subject as regards the causes and the factors involved in resorption of blood from vitreous cavity and anterior chamber.

A N A T O M I C A L C O N S I D E R A T I O N S:-

The main blood supply of the ciliary body, iris, and canal of schlemm arise mainly from the long posterior ciliaries and anterior ciliaries, Leber, T (1903) found that the ciliary body supplied with blood before the vessels anastmose to form the circulus irides major , or a second arterial circle in the ciliary muscle called the circulous arteriousus musculus ciliaris, according to Friedenwald (1974).

The circulus arteriosus irides major presents in the ciliary stroma close to the anterior chamber and circular fibres of the ciliary body, Duke Elder (1959) described the circulus major as arterial only, while the circulous minor as arterial and venous.

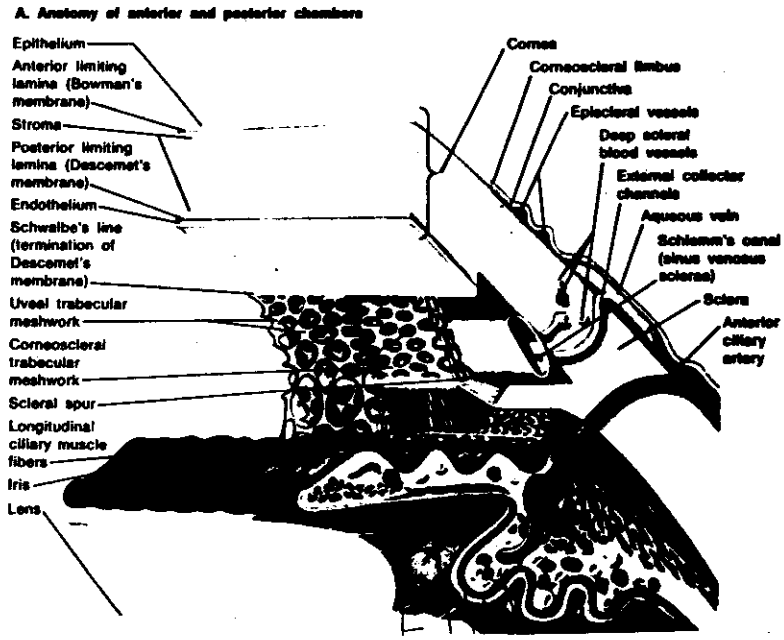
The iridial vessels were described by keeney (1972) as they had a peculiar characters, very thick adventitia, non fenestrated endothelium, dense capillary plexus around the sphincter, and another less dense plexus infront of the dilator. Duke Elder (1974) added that the iris capillaries were less evident or almost absent, in the anterior limiting layer, but a loose network in the ciliary region

could be detected.

The blood vessels of the ciliary body present mainly in the ciliary processes and muscle stroma, Nakajima., and Ishikawa (1962) observed that this stroma increased with age, and most of the vessels are capillaries and veins. Biarati., and Orzalesi (1960) ., and Warwick (1976) described the characters of the vessels of the ciliary body which are very week, thin, with fenestrated endothelium .

It was generally stated before that , the canal of schlemm contains no blood, until Leber (1872) Fuchs (1917)., and Bussacca (1945) proved that, blood could be normally present in the schlemm's canal.

The intra-scleral venous plexus receives junctional branches from the schlemm's canal, Maggiori (1917) found that they run from the anterior aspect of the canal.Theobold (1934) recorded about 25 - 35 collector channels leaving the scleral sinus or in the neighbourhood of the canal. Another vascular communications of the canal were reported by Wolff(1950) , the arteries near the canal probably form a circular vessel which run, close to the canal. Friedenw-



Anatomy of the anterior and posterior chambers.

Gross anatomy of the vitreous.

. Cloquet's canal is located slightly nasally when below the axial line and slightly temporally when above.

ald (1974) added that the arteries may actually be found in the canal, and sometimes fine arterial branches actually opened in the canal . Ashton (1952) traced some of the aqueous veins into the canal.

The main blood supply of the retina comes mainly from the central retinal artery, which comes off the ophthalmic artery close to the optic foramen, Quain (1894) described these end arteries, while Holmes (1918) was the first to correlate between the similar direction of the main retinal vessels branches and the corresponding nerve fibres, usually these branches especially the parent vessels were found by Terche (1965) to be surrounded with a relatively free capillary zone which at the end gives a capillary twigs to supply the ganglion and the outerside of the inner nuclear läyer, but no farther, the retina to the outerside of this point being avascular according to Warwick (1976) . The macular area received its blood supply from the superior and inferior macular vessels, Leber (1972) described the radial capillary loops to arise from these vessels which leaves an avascular zone at the fovea.

The changes in the retinal arteries after their divisions were discussed by many authers, Feeny (1965)., and Hogan (1971) observed that they become much thinner and the musculosa less developed, while Henkind (1967) recorded little or no elastic tissue.

The end of the arterial devisions are a retinal capillaries which mainly present in two capillary plexuses, the superficial and the deep one, His (1880) described the superficial as arterial and the deep capillary net as venous, while Michaelson (1940)., and campbel (1940) denied this. There was much controversies about the anastmosis between the superficial and the deep groups, Henkind (1961) strongly supported this type of anastmoses, Wise et al (1971) not only proved this but also they observed a more complex stratifications around the macular area. On the other hand Tousaint et al (1961)., and Marquardt (1966) denied this form of stratifications.

The vascular bed of the optic disc was studied by Anderson ., and Braver man (1976) especially the arterial pathways and the capillary networks, they considered as one

segment of a continuous microvascular system, traced from the retina into the main portion of the optic nerve and the central nervous system. On the other hand, Francois., and Neetens (1954) that choriocapillaries were a separate capillary system, and this separateness was recorded in (1970) by Swietliczko., and David.

Around the optic disc, the branches of the circulus arteriosus and those of the arteria centralis, were found to anastmose with each other, according to Singh., and Dass (1960) , Hayreh (1969) added that from these anastmoses , branches to the macular area arised . At the junction betw-een the disc and retina, Douglas., and Sanley (1976) obser-ved a cuff of vessels, which were seemed equivalent to an anterior extension of the pial vessels.

STRUCTURE OF THE VITREOUS:-

The vitreous structure is generally considered to con-sist of a random distribution of collagen fibres in the form of a network against the old view by Friedenwald and stiehler (1935)., Grignolo (1952)., and Rossi (1953) that the vitreous fibres were arranged in the form of a parral-

lel sheath. In (1970) Druett and Schepens., Joyce (1970)., and Francois, et al (1970) added that the network of the vitreous fibres are filled with spong like coils of hyaluronic acid molecules and these fibres only appeared after dehydration, since the mucopolysacchrides that cover them in a hydrated state form an entity that had the same refractive index as the collagenous fibres. That is why the appearance of the vitreous was initially homogenous.

The vitreous resembles a true gel, holding a large quantity of water molecules in a viscous, elastic, and semisolid state. Meyer and Palmer (1936) classified the constituents of the vitreous into:-

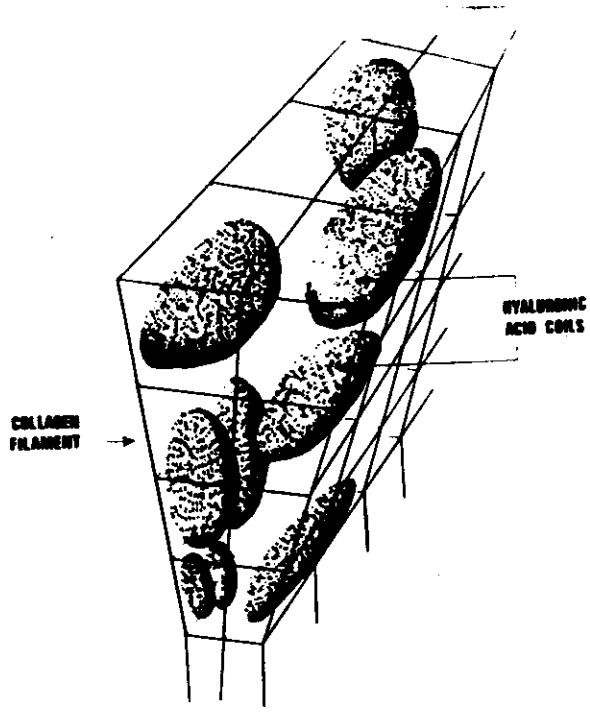
1- a queous humour solutes and metabolites which percolated back into the vitreous.

2- Polymers of hyaluronic acid, which give viscosity to the vitreous.

3- The residual protein fraction imparted gell-like properties (collagen).

Schimek and Steffensen (1955) classified the vitreous fibrils into three kinds, collagen , collagen like fibrils, and

The composition of the vitreous gel and the role of the hyaluronic acid in the maintenance of vitreous viscosity.



Hyaluronic coils contained within the collagen fibers. The ability of the hyaluronic acid molecules to retain large numbers of water molecules helps to increase the rigidity of the vitreous gel. (From Balazs EA: Physiology of the vitreous body. In Schepens CL (ed): Importance of the Vitreous Body in Retina Surgery With Special Emphasis on Reoperations. St. Louis: Mosby, 1960.)

Liquefaction of the vitreous occurs when collagen filaments are no longer separated by the hyaluronic acid macromolecules due to depolymerization of the hyaluronic acid and release of the water the macromolecules contain. The filaments then coalesce to form collagen fibers. (From Balazs EA: Physiology of the vitreous body. In Schepens CL (ed): Importance of the Vitreous Body in Retina Surgery With Special Emphasis on Reoperations. St. Louis: Mosby, 1960.)

unidentified type. To the contrary, Jaffe (1971) described it as one unit made up of shorter collagenous fibrils surrounded by a finer sheath and the whole were covered by a cuff along the length of the fibre from mucopolysaccrides, and these fibrils could slide over one another in the direction of their long axis.