

# CONJUNCTIVAL PIGMENTATION

THESIS

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# **REVIEW OF LITERATURE**

PIGMENT & DISTURBANCE OF PIGMENTATION

Pigment And Disturbances Of Pigmentation

Melanin and melanocytes :

Alterations of pigmentation involve pigments which are endogenous and exogenous . Among the endogenous, melanin is the most important, but hemoglobin, hemosidrin, acid hematin, lipochromes and certain compounds of copper must also concern the ophthalmic pathologist. Soluble salts of iron released from intraocular foreign bodies are common exogenous causes of a focalized or generalized increase in ocular pigmentation. Mercurial salts and tatoos are much less common ( Zimmerman, 1966 ) .

Melanin is the pigment responsible for most of the physiological and pathological colour variations in the skin and ocular tissue ( Greer, 1979 ) .

Melanocytes are mature melanin-forming cells. The term melanoblasts implies an immature cell in the melanocytic series. Macrophages which have ingested melanin granules are known as melanophages and sometimes as chromatophores . Melanophore means melanin carrier cells and refer either to melanophages or to contractile cells found in lower animals ( Greer, 1979 ) .

The DOPA ( 3-4, dihydroxy phenyl alanine ) reaction is used to identify melanocytes by demonstrating the presence of tyrosinase ( DOPA-oxidase ) in their cytoplasm. This enzyme converts the DOPA " reagent " to black DOPA-melanin . Only, cells actively forming melanin give this reaction ( Greer , 1979 ) .

In the human body, melanocytes have the following principal locations :

1. Epidermis .
2. In the dermis as a developmental anomaly .
3. Juxtacutaneous epithelia, e.g. conjunctiva, nose , mouth, rectum and vagina .
4. Subconjunctivally, in the episclera as a developmental anomaly .
5. Within the globe-uveal melanocytes, the retinal pigment epithelium and the pigmented epithelium of the ciliary body and iris .
6. In the pia mater over the ventral surface of the medulla. These melanocytes are the source of rare primary malignant melanomas of the meninges and brain which are notable for the fact that they rarely, if ever, metastasize outside the central nervous system .

Melanocytes are present in the conjunctiva of the coloured races . In the white races, these cells are present but not usually pigmented . The melanin can , however, always be brought out by the DOPA reaction or silver stains . These cells are found at the limbus, in the fornix, in the plica, and caruncle, and at the site of perforation of the anterior ciliary vessels .

With the exception of the retinal pigment epithelium and the pigment epithelium of the ciliary body and iris which are derived from the optic cup, all melanocytes are thought to originate in the neural crest ( Greer, 1979 ) .

According to Mann ( 1950 ), cutaneous and uveal pigmentation increases after birth while that of the pigment epithelium remains stationary .

Variations in pigmentation due to genetic, hormonal, environmental and other influences are observed in the uvea but rarely in the pigment epithelium . An exception to this, is observed in complete albinism where there may be a total lack of melanin formation . In dark races , a great increase in uveal melanin may be evident, yet the pigment epithelium, seemingly possesses all the pigment it can hold, even in blondes, reveals no increase (Zimmerman, 1966) .

Many forms of increased melanotic pigmentation are observed in the skin, conjunctiva and uvea .

Microscopically , these can usually be lumped into two main categories :

1. Increased pigmentation without other obvious cytologic or architectural alterations of the affected tissues ;

AND :

2. Increased pigmentation associated with hypertrophy and / or hyperplasia of melanin-forming cells

( Zimmerman, 1966 ) .

A simple increase in the content of melanin , accompanied by an inconspicuous increase in melanoblastic " clear cells " but without more noteworthy activity , accounts for the variations commonly observed between persons of different races, after sun-tanning, in such discrete lesions as freckles and cafe-au-lait spots, and with endocrine alterations such as occur in Addison's disease and pregnancy . In contrast with these, are the cellular nevi and melanomas . Nevi are characterized by the presence of an increased number of melanocytic cells which usually are also of increased size ( Zimmerman , 1966 ) .

Racial Variations :

The basal cells of the limbal conjunctiva frequently contain melanin granules in their cytoplasm . This is a constant finding in the darker races but it is not infrequent in the white races . The pigmentation is not congenital but develops after the sixth month of life ( Zimmerman , 1966 ) .

Melanosis :

Congenital melanosis may occur in conjunctiva alone or may be associated with ocular and facial melanocytosis. In either case, the pigmented melanocytes lie in groups in the deeper submucosal layers, and aggregate especially around the emissaria of the vessels and nerves of the eye ball ( Zimmerman , 1966 ) .

The earlier literature on congenital melanosis of the eye has been reviewed by Francois (1934), and those cases where the skin of the face was also involved were collected by Mishima and Mevorah (1961) when discussing the naevus of Ota. Ota ( 1939 ) described the condition of melanosis bulbi associated with pigmentation of the face as "naevus fusco caeruleus ophthalmo maxillaris" ; this name has not become popular, the condition being most commonly known as "naevus of Ota" or "oculodermal melanosis" .



Naevus Of Ota

Malignant change is very rare but malignant melanomas in the choroid, iris or orbit have been very occasionally recorded in association with this naevus ( Greer , 1979 ) .

Systemic diseases :

Congenital pigmentation occurs in icterus , where bile pigments are deposited subepithelially and in Addison's disease where melanin is found in the conjunctiva.

Exogenous :

\* Argyrosis of the conjunctiva is usually due to a prolonged ingestion or topical administration of silver-containing drugs . Most of the metal lies immediately beneath the epithelium as fine greyish granules, but some silver deposits also can be found in the deeper epithelial layers . The silver lies mostly around elastic fibers for which it has a great affinity .

\* Atebrine may produce a discoloration of the conjunctiva in patients who were receiving the drug for malaria or who were exposed to it during its manufacture . The pigmentation is reversible when exposure to atebrine is discontinued .

\* Gold deposits can be found in the conjunctiva in cases of chrysiasis that occur after prolonged parenteral gold treatment . According to Roberts and Wolter (1956) gold is found subepithelially as well as among the epithelial cells . Pigmentation of the conjunctiva may occur after repeated local applications of ointments containing "Mercury" . According to Long and Danielson ( 1951 ), this is usually accompanied by a discoloration of the skin of the lids .

\* Workers exposed to "Aniline dye" may acquire pigmentation of the conjunctiva and cornea in the interpalpebral fissure. According to Anderson and Oglesby ( 1958 ), the pigment lies in the basal cells of the epithelium and in the sub-epithelial tissues .

Hematogenous :

A hematogenous pigmentation may appear after extensive subconjunctival hemorrhages . The pigment usually is hemosiderin , which is deposited around the blood vessels and basal epithelium , and between the stromal fibers ( Zimmerman , 1966 ) .

PIGMENTED TUMOURS OF CONJUNCTIVA