

DISPELLING THE MYTH OF THE BLACK PIGMENT STONE: A MULTIVARIATE ANALYSIS OF FACTORS ASSOCIATED WITH PIGMENT GALLSTONE COLOR AND BACTERIAL PRESENCE

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Background: Tradition and consensus conferences hold that Western pigment stones are usually black; sterile, located in the gallbladder (GB), associated with hemolysis, and composed of conjugated bilirubin. We examined the validity of these concepts using multivariate analysis.

Methods: 302 pigment stones were studied. Stones (and bile) were cultured, examined with SEM, composition determined (FTIR). Multivariate analysis of factors associated with black pigment and sterile stones was done.

Results: 145 (48%) black and 157 (52%) brown stones. Factors correlating with black stones on bivariate analysis (Table) did not correlate on multivariate analysis. Similar factors correlated with sterile stones on bivariate analysis, but not hemolysis (Table). Hemolysis correlated with black color, but was infrequent and did not correlate with sterile stones. On multivariate analysis sterile bile and absence of CaPalmitate correlated with sterile stones, but these factors could not exclude gallstone bacteria.

Conclusions: The sterile black pigment stone of Western civilization is a myth. Only stone culture or SEM exam can exclude gallstone bacteria, other factors cannot act as a surrogate. The pigment stone classification should be updated to reflect empiric evidence not medical lore.

	Incidence Black Stones	BivariateP	MultivariateP	Incidence Sterile Stones	BivariateP	MultivariateP
Stones GB	57%	<0.0001	0.785	44%	<0.0001	0.087
Sterile Bile	54%	<0.0001	0.524	78%	<0.0001	0.038
Hemolysis	19%	<0.0001	0.061	44%	0.063	0.688
ConjBili	41%	0.05	0.068	23%	0.992	--
No CaPalmitate	60%	0.009	0.323	35%	<0.0001	0.027