THE STUDY OF UMBILICAL STUMP CHANGES

A THESIS

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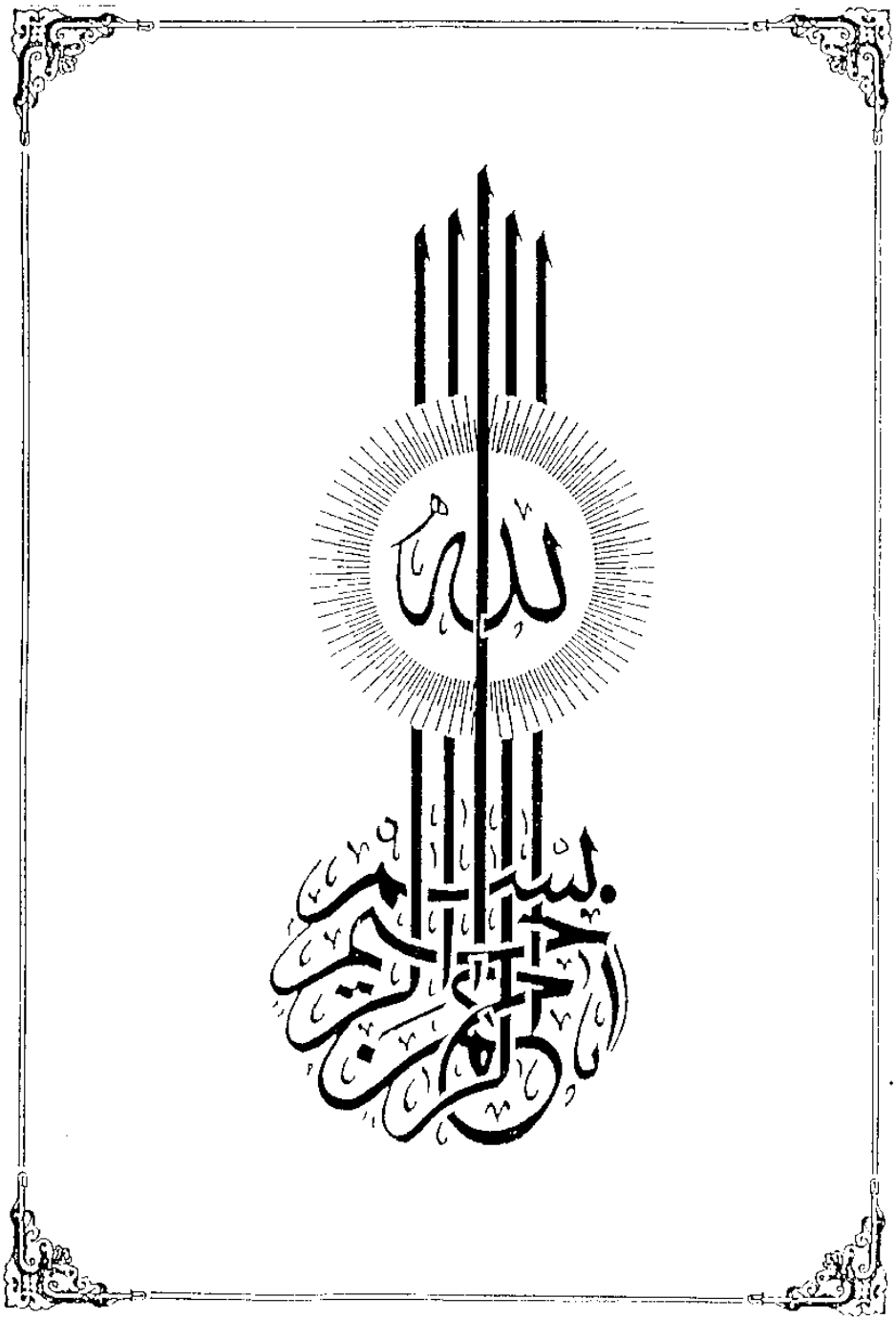
TO MY PARENTS



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INTRODUCTION

Umbilical stump sepsis is an important complication to the neonate. It is usually mild and present as a scanty purulant discharge. In more severe cases the surrounding skin may be red and oedematous. In rare instances the infection may lead to septiceamia, tetanus neonatorum, ascending hepatic infection and peritonitis which are considered a major cause of neonatal death due to infection.

AIM OF THE WORK

To study the clinical, bacteriological and pathological changes of umbilical stump from different conditions of deliveries comparing silk suture with umbilical clamp.

REVIEW OF LITERATURE

ANATOMY

The umbilical cord or funis, extends from the fetal umbilicus to the fetal surface of the placenta. Its exterior is dull white, moist and covered by amnion except where it approaches the fetus an epithelial covering is substituted, through which the three umbilical vessels may be seen (Novak and Woodruff, 1979).

Its diameter is 1 to 2.5 cm, with an average length of 55 cm and a usual range of 30 to 100 cm. Folding and tortuosity of the vessels, which are larger than the cord itself, frequently create nodulations on the surface, or false knots, which are essentially varices.

The two arteries are smaller in diameter than the vein. When fixed in its normally distended state and when fully developed the umbilical vessels, particularly the arteries, are provided with a strong muscular coat which contracts readily in response to mechanical stimuli. The outermost muscle bundles pursue an interlacing spiral course so that, when they contract, they produce shortening of the vessel and thickening of

the media, with folding of the interna and considerable narrowing of the lumen. This action may account for the periodic sharp constrictions of contour- the so - called valves of Hoboken which often characterize these vessels (Warwick and Williams, 1980).

The umbilical artery exhibits transverse intimal folds of Hoboken across part of its lumen. The mesoderm of the cord, which is of allantoic origin, fuses with that of the amnion. (Chacko and Reynods, 1954).

The umbilical vessels are rarely straight but usually show a twisted conformation which may exist as either a right- or a left -handed cylinderical helix. The number of turns involved may be relatively few or, at the other extreme, may even exceed 300 turns. Their causation has been variously ascribed to unequal growth of the vessels, or the torsional forces imposed by fetal movements; their functional significance is obscure (Prichard and Macdonald, 1985).

EMPRYOLOGY

The yolk sac, and the umbilical vesicle into which it develops, are quite prominant at the beginning of pregnancy. At first the embryo is a flattened disc interposed between amnion and yolk sac. Since the dorsal surface grows faster than the ventral surface, in association with the elongation of the neural tube, the embryo bulges into the amniotic sac and the dorsal part of the yolk sac is incorporated into the body of the embryo to form the gut.

The allantois projects into the base of the body stalk from the caudal wall of the yolk sac or, later, from the anterior wall of the hindgut.

As pregnancy advances, the yolk sac becomes smaller and its pedicle becomes relatively longer. By about the middle of the third month, the expanding amnion obliterates the exocelom, fuses with the chorion laeve, and covers the bulging placental disc and the lateral surface of the body stalk, which is then called the umbilical cord, or funis. Remnants of the exocelom

in the anterior portion of the cord may contain loops of intestine, which continue to develop outside the embryo.

Although the loops are later withdrawn, the apex of the midgut loop remains its connection with an attenuated vitelline duct that terminates in a crumpled, highly vascular sac 3 to 5 cm in diameter lying on the surface of the placenta between amnion and chrorion or in the membranes just beyond the placental margin, where occasionally it may be identified at term.

The vessels in the cord at term normally are two arteries and one vein. The right umbilical vein usually disappears early during fetal development, leaving only the original left vein. Section of any portion of the cord frequently reveals, near the center, the small duct of the umbilical vesicle, lined by a single layer of flattened or cuboid epithelial cells. In sections just beyond the umbilicus, but never at the maternal end of the cord, another duct representing the allantoic remnant occasionally is found. The

intra-abdominal portion of the duct of the umbilical vesicle, which extends from umbilicus to intestine, usually atrophies and disappears, but occasionally it remains patent, forming Meckel's diverticulum (Pritchard and Macdonald, 1985).