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HUMORAL PRECAUTIONS IN SURGERY WITH SPECIAL REFERENCE TO CIRCUMCISION

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ABSTRACT

Theory of humors is given by father of medicine "Hippocrates" (460-377 $_{B.C.}$) and unani system of medicine is based on it. The imbalance of these humors causes diseases and the balance of these keeps the body healthy with a specific *Mizāj* (Temperament). The body contain four (major kind of) humors; *Dam* (blood), *Balgham* (phlegm), *Ṣafrā* (yellow bile) and *Sawdā* (black bile). *Ṣafrā* causes *Ḥar Amrāḍ* including *Yarāqan Aṣfar* (Jaundice). Circumcision is the surgical removal of the skin covering the tip of the penis. It is an ancient practice that has its beginning in religious rites. The procedure is typically done at first or second day on a newborn for personal or religious reasons. Circumcision in older children and adults may also be done for the many reasons. Risk of bleeding and infection at the site of the circumcision are the important complication of circumcision. Neonatal jaundice/ *Yarāqan Aṣfar* (disharmony of *Khilṭ-i-Ṣafrā'*) is the important problem in first week of life. Nearly 60% of term new born becomes visibly jaundiced in the first week of life. Neonatal jaundice is one of the causes of excess bleeding during circumcision because it impairs the coagulation and blood clot formation (prolong bleeding time). So it is better to postpone circumcision until complete recovery of jaundice because there is considerable risk of bleeding. Coagulation profile must be checked before performing this procedure. In case of pathological neonatal jaundice liver dysfunction occur so it is necessary to treat jaundice first before circumcision. In case of physiological jaundice there is no liver dysfunction so it is not a contraindication to circumcision, but it is better to delay circumcision in it also. Physiological jaundice disappears on itself only by care like proper breast feeding. There is no need to expose the baby to direct sunlight to reduce hyperbilirubinemia. Pathological jaundice is treated with phototherapy.

KEYWORDS: *Yarāqan Aṣfar*, Neonatal jaundice, circumcision, pathological jaundice, physiological jaundice.

INTRODUCTION

According to *Tibb*, the human body is considered to be composed of seven natural principles or components of the body known as *Umūr Ṭābī'yya*, namely: Arkān (four basic constituents), *Mizāj* (Temperament), *Akhlāṭ* (Humors), *A'ḍā* (Organs), *Arwāḥ* (Life spirit, pneuma), *Quwā* (Faculty)، and *Af'āl* (Action). These are the very factors responsible for the existence of human body and are considered responsible for the maintenance of health. The loss of any one of the components could lead to death of the individual.[1]

AKHLĀT (Humors): Theory of humors is given by father of medicine "Hippocrates" (460-377 $_{B.C.}$) and unani system of medicine is based on it. The imbalance of these humors causes diseases and the balance of these keeps the body healthy with a specific *Mizāj* (Temperament).[2],[3] The body contained four (major kind of) humors, namely: *Dam* (blood), *Balgham* (phlegm), *Ṣafrā* (yellow bile) and *Sawdā* (black bile). A right proportion of these humors, according to quality and quantity, and mixing of which (homeostsis) constitutes health and inaccurate proportion and irregular distribution according to their quantity and quality constitutes diseases.[1] Healthy or good humors transformed into actual body-substance, either by itself or in combination with something else. In short it is that which replaces the loss which the body substance' (continually) undergoes.[4]

***Khilṭ-i-Dam* (Sanguinous humor):** It is the humor of *Ḥar* (hot) *Ratab* (wet) *Mizāj*. *Tabai Khilṭ-i-Dam* has following characteristics- Red color, sweet taste, homogenous brightness, no any unpleasant odor. *Dam* is the most abundant *Khilṭ* of body, it performs various functions like- provides nutrition to the body, keeps the body warm, prevents the hazard of coldness, maintains the viscera warm, generates pneuma from its diluted part,

replenishes the tears, distributes the *Ḥarārat Gharīziyya*, provide the good looks.

Disharmony of *Khilṭ-i-Dam* develop different Diseases like- epistaxis (*Nakseer)*, haemoptysis **(***Nafsuddam)*, hematemasis *(Qaiuddam)*, typhoid fever *(Ḥummā Mi'wiyya)*, *Tap-e-Matbaqah*, *Waram Ḥar*, Abscesses (*Khurāj)*, *rashes (Damamil), Dubailah***,** migraine *(Shaqiqa)* and varicose vein (*Dawali).*[5], [6], [7], [8]

Khilṭ-i-Balgham **(phlegm):** It is the humor of *Bārid* (cold) *Ratab (*wet) *Mizāj*. *Tabai Khilṭ-i-Balgham* is of white in colour, moderate in viscosity, transparent and tasteless. It performs various functions in the body; Maintains moisture in the organs and joints, nourishes the brain, when required it is converted into *Khilṭ-i-Dam* by *Ḥarārat Gharīziyya*.

Disharmony of *Khilṭ-i-Balgham* develop various diseases like- paralysis (*Falij)*, facial palsy (*Laqwah*), apoplexy (*Saktah)*, *Nisyan*, , *Lisarghus* , *Ḥummā Balghamiyya*, tremors (*Rasha)*, convulsions (*Tashannuj)*, night mare (*Kabus)*, vertigo, giddiness (*Sadar)*, edema (*Tahabbuj)*, epilepsy (*Sara)*, paresthesia *(Khidr)*, *Warm-e-Sulb wa Layyan*.[5], [6], [7], [8]

Khilṭ-i-Ṣafrā **(Yellow bile):** It is the humor of *Ḥar Yābis* (dry) *Mizāj*. *Tabai Khilṭ-i-Ṣafrā* is of reddish yellow in colour, bitter in taste. It performs various functions in the body; Helps the blood to flow through the small vessels and capillaries easily, nourishes the *Marāra* (gall bladder), helps in digestion of food, washes the sticky secretion from small intestine, stimulate the process of defecation.

Disharmony of *Khilṭ-i-Ṣafrā* develop various diseases like- bilious fever **(***Ḥummā Ṣafrāwī)*, acute fever (*Hummiyate Haddah)*, jaundice (*Yarāqan Aṣfar*), hepatitis (*waram al-kabid*), *Barsam Ḥar*, gangrenous pustules, *faranitus*, ulcers of urinary bladder and intestine.[5], [6], [7], [8]

Khilṭ-i-Sawdā **(Black bile):** It is the humor of *Bārid* (cold) and *Yābis* (dry) *Mizāj*. It is reddish black in colour, sour and astringent in taste. It performs various functions in the body; provide strength to the bones, makes the blood viscous, nourishes the spleen, increase appitite.

Disharmony of *Khilṭ-i-Sawdā* develop various diseases like- depression (*Mālankhūliya*), cancer (*Sartan)*, *Hummae Raba*, varicose vein (*Dawali)*, leprosy (*Juzam)*, insomnia *(Sahr)* elephantiasis (*Da-ul Fil)*, , indigestion (*Su-i-Haḍm).*[5], [6], [7], [8]

Unani System of medicine is one of the oldest traditional system of medicine which has strived through ages in the treatment as well as prevention of diseases. There are four methods of therapeutic treatment- Regimenal therapy (*'Ilāj-bi'l-Tadabīr*), Dietotherapy (*'Ilāj-bi'l-Ghiza/'Ilāj-bi'l-Taghziya*), Pharmacotherapy (*'Ilāj-bi'l-Dawā*), Surgery (*'Ilāj-bi'l-Yad*).[2], [9]

Surgery (*'Ilāj-bi'l-Yad*): Surgery is a branch of medicine concerned with diseases and conditions requiring or amenable to operative or manual procedures [10]. The Arab physician **Abu al-Qasim al-Zahrawi** (936-1013) has been described as the **"father of surgery"**. His principal work is the Kitab-Al-Tasrif , a 30 volume medical encyclopedia.[11]

In unani system of medicine there are three basic causes of any disease—*Sū'-i-Mizāj*, *Sū'-i-Tarkīb* and *Tafarruq-i-Ittiṣāl.* Separately these factors are responsible for development of *Maraḍ mufrad*, but *Maraḍ murakkab* is caused by combination of two or three of above causative factors. Most of the time whenever sue *Mizāj* persists it leads to *Sū'-i-Tarkīb* and surgery is the procedure to treat *Sū'-i-Tarkīb*.[12]

CIRCUMCISION: Circumcision is to cut the protecting loose skin off a boy's or man's penis, for medical, traditional, or religious reasons. (Cambridge English dictionary).

Circumcision is one of the earliest recorded operations and remains an important tradition in some cultures. Routine neonatal circumcision is performed in some western societies but the practice has been increasingly criticized. Proponents point out that circumcision reduces the incidence of urinary tract infection in infant boys. The medical indications for circumcision are- phimosis, recurrent balanoprosthitis, recurrent urinary tract infection, circumcision reduce the risk of HIV transmission.[13]

Historical aspects: The world's oldest account of circumcision is an image in an Egyptian tomb.[14] Circumcision was instituted by priests as a religious practice in the fifth century bce.[15] It has a long history in ancient societies of the Middle East. In the view of ancients who emulated the Egyptians, circumcision seems to have been not just a matter of hygiene but of moral, spiritual, and intellectual refinement. Circumcision is a major part of the ritual for such religions as Judaism, Christianity, and Islam, and it is probably no accident that all of these arose in the Middle East. By contrast, in religions arising outside the arid Middle East (Hinduism, Shintoism, Buddhism), there is no ritual circumcision. In aboriginal society in Australia, circumcision is practiced also.[16] Historically, it was within this Mosaic religious paradigm that circumcision emerged as the characteristic mark of Judaism. In the Christian era, many intellectual and spiritual traditions in Judaism carried circumcision far beyond its biblical origins.[14]

Apparently, circumcision did not originate among the Jewish people: they took the practice either from the

Babylonians or from African tribes, probably the latter. It had been practiced in West Africa for over 5000 years.[13]

Benefits of circumcision: There is some evidence that circumcision has health benefits, including:

- Prevention of urinary tract infections (UTI).
- Decreased acquisition of human immunodeficiency virus (HIV). The world health organization (WHO) is highly engaged in remedying the HIV epidemic, especially in sub-Saharan Africa. In addition to counseling safer behavior and early initiation of antiretroviral therapy, circumcision, especially in high prevalence areas, is recommended.
- Decreased transmission of human papilloma virus (HPV), syphilis and herpes.
- There is a reduced risk of cancer of the cervix in female sex partners.
- Circumcision provides the definitive treatment for phimosis and recurrent balanitis
- There is a reduced risk of penile cancer. Circumcision soon after birth confers immunity against carcinoma of the penis. Later circumcision does not seem to have the same effect.[13], [16], [17], [18]

Procedure of circumcision: Dorsal penile nerve block (DPNB) and EMLA (eutectic mixture of local anesthesia) both are safe in new born but do not completely eliminate the pain. Caudal block usually combine with general anesthesia, provides longer duration of anesthesia but has a higher incidence of side effects and technical failures. General anesthesia with or without local anesthesia, may be considered by some to be an unacceptable risk in neonates for such minor surgery.[19] In case of newborn circumcision, the prepuce and the part or all of the frenulum are removed.[13] In newborn the most common technique of circumcision is Gomco clamp, followed by the Plastibell and the least common is Mogen clamp.[17]

1. **The Gomco Clamp**: In this method first separate the foreskin from the head of the penis by using a probe, then fit a bell shaped over the head of the penis and under the foreskin, then pulled up the foreskin over the bell and then tighten a clamp around it to diminish blood flow to the area. A scalpel is used to cut and remove the foreskin.[20] In Gomco clamp there is lesser chances of infection since no plastic ring is retained after procedure, but there is increased risk of bleeding more than the Plastibell method. And in this procedure petroleum jelly is wanted to protect the exposed glans and the residual prepuce during the healing process.[17]

2. **The Mogen Clamp:** The foreskin is first extended using several straight hemostats. The Mogen clamp is then slid over the foreskin. The clamp is locked after confirming that the tip of the glans is free of the blades, and then cut the skin from the flat (upper) side of the clamp by using a scalpel. In newborns, there is no need of sutures.[21] The Mogen clamp associated with less pain and it is of short duration compared to the Gomco clamp or Plastibell technique.[19]

3. **The Plastibell Technique:** Plastibell is a single-use disposable plastic device mainly used to circumcise infants, but it can be used for boys up to 12 years of age. The Plastibell procedure is initially similar to the Gomco. The procedure differs as the plastic ring (plastibell) is applied rather than a metal clamp. In this method after separation with a probe, the plastic bell is positioned under the foreskin and over the head of the penis. A piece of suture is fixed directly around the foreskin, which cuts off the blood supply to the foreskin. A scalpel may then be used to cut off the extra foreskin, but the plastic ring is left on. The ring falls off after 4 to 7 days, leaving a circumferential wound that heals in 1 to 2 weeks. Plastibell effectively protects the exposed glans so no petroleum jelly is needed.[17], [20], [21]

All infants must ideally follow-up by the person who performed the circumcision, within 10–14 days to ensure appropriate healing.[19]

Complications/risks of circumcision: Bleeding and infection are well recognized complications and more serious hazards. Other complications are removal of too much or too little skin, Risk of injury to the penis, preputial adhesions to the coronal margin or glans, meatal stenosis, penile skin bridges, glans amutation, urethrocutaneous fistula, ablation of the phallus and post circumcision phimosis, unacceptable cosmetic outcomes, discomfort, potential changes in penile physiology, particularly as it relates to future sensation or sexual functioning.[13], [19], [22]

Contraindications of neonatal circumcision: A pre-circumcision exam must be done prior to applying surgical drapes lest a more subtle anomaly be obscured.

Contraindications include- Bleeding disorders, inadequate age/health of infant, congenital malformations, insufficient size, family history of bleeding disorders like hemophilia or thrombocytopenia until screening for these disorders has been completed, genital urinary congenital abnormalities that will likely require surgical repair including hypospadius, epispadius, chordee, micropenis ,webbed or buried penis, penoscrotal transposition, penile tortion, penoscrotal webbing, bilateral impalpable testes, significant hydrocele and hernias,[19], [23]

NEONATAL JAUNDICE (*Yarāqan Aṣfar*): It is disharmony of *Khilṭ-i-Ṣafrā'*. It refers to a yellowish tint to the body tissues, including yellowness of the skin and deep tissues due to increased in the serum bilirubin levels.[24],[25] Jaundice is a common manifestation among newborns. Approximately, it is encountered in about 75% of them.[26]

Pathological versus physiological neonatal jaundice: Physiological jaundice represents physiological immaturity of the neonates to handle increased bilirubin production.[25] Physiologic jaundice generally occurs on day 2 to 4, peaks between 4 to 5 days and resolves in 2 weeks. Physiologic jaundice never occurs in the first 24 hours.[27] It does not require any treatment. Pathological jaundice is referred to as an elevation of total serum bilirubin (TSB) levels to the extent where treatment of jaundice is more likely to result into benefit than harm. There is no clear cut demarcation between pathological and physiological jaundice.[25] Pathologic jaundice may occur in the first 24 hours of life and is characterized by a rapid rate of rising in the bilirubin level more than 0.2 mg/dl per hour or 5 mg/dl per day.[28] Such jaundice warrants investigation for the cause and therapeutic intervention such as phototherapy.[25]

Causes: Important causes of pathological neonatal jaundice are.

- Hemolytic: Immune-mediated hemolysis such as ABO incompatibility and Rh incompatibility, non-immune mediated causes such as cephalohematoma, enzyme defects like glucose-6-phosphate dehydrogenase (G6PD) deficiency and pyruvate kinase deficiency, red blood cell membrane defects like hereditary elliptocytosis and spherocytosis.
- Non hemolytic: Prematurity, extravasated blood, inadequate feeding, polycythemia, breast milk jaundice and idiopathic.
- Obstructive jaundice: In this bilirubin is conjugated. It occurs due to congenital obliteration of the bile ducts. Neonatal hepatitis is the frequent cause of obstructive jaundice.
- Miscellaneous causes of neonatal jaundice: Neonatal sepsis, neonatal hepatitis.[25],[28]

Clinical estimation: All neonates should be visually inspected for jaundice every 12 hr during initial 3 to 5 days of life. Transcutaneous bilirubin can be used as an aid for initial screening of infants. In newborn, dermal staining progress in a cephalocaudal direction. The newborn should be examined in good daylight. The skin of forehead, chest, abdomen, thighs, legs, palms and soles should be blanched with digital pressure and the underlying color of skin and subcutaneous tissues should be noted. Serum level of total bilirubin is approximately 4-6 mg/dl (zone1), 6-8 mg/dl (zone 2), 8-12 mg/dl (zone 3), 12-14 mg/dl (zone 4) and 15 mg/dl (zone 5). Yellow staining of palms and soles is a danger sign and requires urgent serum bilirubin estimation and further management. Phototherapy should be initiated if the infant meets the criteria for serious jaundice. Total serum bilirubin should be determined subsequently in these infants to determine further course of action.[25]

Investigations to rule out neonatal jaundice: Hemoglobin, peripheral smear, reticulocyte count, ABO and Rh blood grouping of mother as well as baby, coomb's test of mother as well as baby, serum bilirubin, both direct and indirect, blood culture, liver function tests, G-6-PD enzyme studies.[26]

Management: physiological jaundice does not require any treatment. Pathological jaundice requires treatment.[25] Whatever the cause of the hyperbilirubinemia, it is essential that the bilirubin level is kept low enough to prevent kernicterus. In full-term infants the danger level of unconjugated bilirubin is usually taken as, 425 micromol/lit (25 mg percent).[29] To bring down the level of serum bilirubin, various regimes are employed: Phenobarbital, Agar agar, Albumin infusion, correction of acidosis, early feeding, phototherapy, exchange blood transfusion.[26] As a first step serious jaundice should be ruled out. Phototherapy should be initiated, if the infants meet the criteria for serious jaundice. Total serum bilirubin should be determined subsequently in these infants to determine further course of action.[25] In the USA, it is the standard of care for all newborns to receive a vitamin K injection within the first 1 h of life. While the purpose of this is to prevent intraventricular hemorrhage, it may be beneficial for the prevention of bleeding with other neonatal procedures – such as circumcision.[19]

Relation between neonatal jaundice and circumcision: Neonatal hyperbilirubinemia is a theoretical contraindication to circumcision. Physiologic hyperbilirubinemia is indicative of an immature liver. The liver is responsible for producing the body's clotting factors (fibrinogen, prothrombin, accelerator globulin, factor VII, and several other important factors). High bilirubin levels can be a marker of liver immaturity, or of a marker of a liver disorder. Yet any correlation between increased propensities to bleed associated with hyperbilirubinemia when using a clamp technique is anecdotal. That said one can take the approach to avoid the procedure in the setting of significant hyperbilirubinemia– at least as a precautionary measure. A good rule of thumb is to delay a circumcision if the hyperbilirubinemia requires phototherapy or has been deemed non-physiologic.[19]

CONCLUSION

It has a long history in ancient societies of the Middle East. Circumcision is one of the earliest recorded operations and remains an important tradition in some cultures. It has many health benefits, also indicated to prevent some diseases as it reduces the incidence of various pathological conditions. It also plays an important role in the treatment of various serious disorders. There are various techniques of circumcision but in neonate three techniques are commonly used; Gomco clamp (most common), the Plastibell and Mogen clamp (least common). There are various complications of circumcision in neonates among them bleeding is the most common and serious hazard, that's why bleeding disorders and family history of bleeding disorders like hemophilia or thrombocytopenia until screening for these disorders has been completed are common

contraindications for this surgical procedure (circumcision).

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