Qur-an, human embryology and nutrition

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Islam, being a complete code of life, encompasses almost all walks of life. The teachings of Islam and Qur-an provide guidance in all spheres of life, whether spiritual, intellectual, political, social or economic. The basic theme of its teachings is to guide humanity towards the righteous path. Qur-an is for the whole humanity. Man is the main subject of the book. How man is created and how development takes place during his life is what Qur-an describes in greater details. The book mentions the precise mechanisms of reproduction and clearly defines the stages involved in reproduction, without providing a single statement marred by inaccuracy. The discussion of physical development of human beings is, however, in the context of Almighty Allah's authority of being the absolute Creator. Human beings starts their lives from the fusion of male and female gametes forming a zygote. Zygote remains in the mother's womb for some time, gets its nourishments from there, grows in size into embryo, and then it is given birth by the mother. The different stages of embryonic development are fertilization, cleavage, gastrulation, neurulation, neural crest formation, and formation of organs or organogenesis. These stages of embryonic development are described in the Holy Qur-an. The term used for semen in the Holy Qur-an is *Maa-in-daafeqan* (fluid ejected fastly). The other terms used in the book for various stages of embryo are *"Nutfah"* (zygote), *Mudghatan* (lump of flesh or developed gastrula), and *Izaman* (soft bone structure just before organogenesis). The details of the embryonic stages mentioned by the Holy Qur-an, though, are in brief but are in excellent agreement with the modern scientific knowledge.

Ovaries, the reproductive organs in females, produce a great number of oocytes, which latter on convert into ova, the female reproductive cells. Sperms, the male reproductive cells, fertilize the ova. The fertilized ovum enters into the fallopian tube and gets implanted on the wall of the uterus.[1] The development of the fertilized ovum into an embryo and a complete baby takes place in distinct 3 phases,[2] each phase of 3 months duration and it is called a trimester. During the first trimester, all the major organs of the body are established. Development of the embryo is essentially complete. From this point, the developing human being is referred to as fetus rather than embryo. During the second trimester, mainly the fetal development is under the control of various hormones. The circulatory system of the fetus completes and is ready for the exchange of materials between the fetus and the mother. In the third trimester, weight of the fetus doubles and nervous system completes. The baby is born after its embryonic development completes. Uterus develops enormous muscular force resulting in expulsion of the baby. This is called parturition or simply delivery. At the time of birth, breasts must have developed and ready for nursing the newborn. After the mother has given birth to a baby, a denser liquid called colostrums is secreted, followed by production of mature milk. The mother's milk is full of almost all essential nutrients, a baby needs for its physiological and physical growth.

All living organisms, including human beings, derive their food from plants and animals. Plants, in return, get their food from soil; it means humans depend on soil for their food. These elements are used for all life activities including reproduction. In the Holy Book this fact is described in these words, *"Man we did create from a quintessence (of clay)."*(32:12) Also in Sura Al-Room, it is stated *"and He created you from dust."*(55:20) At another place, the same idea is described in these words, *"The creation of man from clay."*(4:8) In these verses the creation of human beings is referred to the soil, when inorganic matter becomes living matter. Thus, inorganic constituents of the earth are absorbed into living matter by way of food, and living matter reproduces itself by means of sperm. The child is born, it grows, it decays, and dies. After death, the elements go back to the earth, *"from the earth did we create you, and into it shall we return you, and from it shall we bring you out once again."*(20:58) Fertilization is performed by only a very small quantity of liquid. *"Now let man but think, from what he is created! He is created from a drop emitted – proceeding from between the backbone and the ribs."*(86:5-7) Also at another place, we read *"has there not been over man a long period of time, when he was nothing- (not even) mentioned. Verily we created man from a drop of mingled sperm."*(25:54) In Sura Al-Furqan, *"it is He who created man from water."*(75:37) In Sura Al-Qiyama, the same idea is presented in these words; *"was he (man) not a drop of sperm emitted (in lowly form)"*. In Sura Al-Alaq, *"created man, out of a leech-like clot."*(96:2) And in Sura Al-Sajda; *"And made his progeny from a quintessence of despised fluid."*(41:8) The Arabic word, translated here by the word 'quintessence', is *sulal*. It signifies 'something which is extracted - best part of a thing'.

In Sura Al-Mursala; *"Have we not created you from a fluid (held) despicable; which we placed in a place of rest, firmly fixed."*(77:21) The adjective that in this text refers to the 'firmly fixed' (makin) means the spot where man grows in the maternal organism.

The female ovum is fertilized with the male sperm before a new individual can be born. The fertilized ovum descends to lodge inside the uterus; this is called 'implantation of the egg'. Qur-an calls the lodging of the fertilized egg as womb. After fertilization, zygote continues its growth inside the mother's womb; *"Man we did create from a quintessence (of clay). Then we place him as (a drop of) sperm in a place of rest, firmly fixed."*(23:12) It continues to divide and sub-divide through mitosis. The ball of cells became relatively denser and is termed as *"Alaqa"* by the Holy Qur-an; *"then we made the sperm into a clot of congealed blood; then of that clot we made a (fetus) lump, bones and clothed the bones with flesh; when we developed out of it another creature:"*(40:14) The mass of bones is made into organs as stated; *"He is who shapes you in the womb as He pleases."*(6:3) And at another place, *"We created you out of dust, then out of sperm, then out of a leech like clot, then out of a morsel of flesh, partly formed and partly unformed*."(22:5) The final phase of the human embryo is organogenesis, such as, formation of organs.[2] This is stated in the book in Sura Al-Sajda; *"but He fashioned him (man) in due proportion, and breathed into him of His spirit and He gave you the faculties of hearing and sight and understanding."*(41:4) In Sura Al-Infitar Allah says; *"Him who created thee, fashioned thee in due proportion, and gave thee a just bias."*(82:7) Fashioning, means giving the final touches of completion. In the second month, formation of bones within *"Mudgha"* starts, a fact mentioned in Qur-an. The Arabic word *"Mudgha"* is for the fetus lump and the Arabic word *"Izaman"* is for the initial soft bones structure.

Chromosomes are the main elements in determining gender. Two of the 46 chromosomes that determine the structure of a human being are identified as the sex chromosomes. These 2 chromosomes are called "XY" in males and "XX in females, due to the shapes of the chromosomes resemble these letters. The Y chromosome carries the genes that code for masculinity, while the X chromosome carries the genes that code for femininity.[1] Allah describes the same fact in the Holy Qur-an in these words, *"that He did create the pairs - male and female. From a sperm-drop when lodged (in its place)."*(53:45) In Sura Al-Qiyama, it is stated, *"and of him (man) He (Allah) created 2 gender, male and female*."(75:39) Qur-an gives a description of the embryonic period with a reference that how a mother faces all the sufferings while she bears a baby. It is stated, *"We have enjoined on man kindness to his parents: In pain did his mother bear him, and in pain did she gave him birth. The carrying of the (child) to his weaning is (a period of) 30 months."*(46:15)

The embryo gets its nourishment from the blood of its mother. Most of the early nutrition is made available from trophoblastic digestion and absorption of nutrients from the endometrial deciduus, and that essentially all the latter nutrition results from diffusion through the placental membrane.[1] Allah provides with food every organism; *"there is no moving creature on earth but its sustenance depends on Allah". We created you out of dust, then out of sperm, then out of a leech like clot, then out of a morsel of flesh, partly formed and partly unformed; and we cause whom we will to rest in the wombs, for an appointed term, then we bring you out as babes, then (foster you) that you may reach your age of full strength."*(11:8) In Sura Al-Nahal, *"it is He who brought you forth from the wombs of your mothers*."(22:5) In these verses, Almighty mentions that, after a specific period of time inside the mother's womb, the baby is given birth. After birth, the infant is provided with mother's milk, the best food for the newborns. The baby is guided by Allah to feed on the breast of the mother. *"Have we not made for him a pair of eyes? And a tongue, and a pair of lips? And show him the 2 highways?"*(27:78) The phrase 'highways' in these verses means 'the 2 breasts full of milk from where the newborn gets his food'. In Sura Al-Ahqaf, it is mentioned; *"the carrying of the (child) to his weaning is (a period) of 30 months*."(90:10) Mothers are advised to breast-feed their babies for an appropriate period; *"the mothers shall give suck to their offspring, for 2 whole years."* (2:233) The maximum period of breast-feeding is thus 2 years, a fact in agreement with the modern scientific findings.[4]

From the above discussion and commentary on some of the verses of the Holy Qur-an, it is evident that Qur-an gives scientific description of how a human embryo develops. The close agreement between the teachings of Qur-an and those of science is not only interesting but also confirmative to the fact that only Qur-an is the true book and humanity should seek guidance from it.

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Environmental malignant pleural mesothelioma in Southeast Turkey

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The association between asbestos exposure and the development of malignant pleural mesothelioma (MPM) is well-recognized.[1] There are many asbestos deposits in some rural parts of central and eastern Anatolia.[2] The southeast region is one of the places in Turkey that has a high incidence of MPM. Direct contact of patients with asbestos was defined in some boroughs of Diyarbakir province, Elazig province, and Sanliurfa by Yazicioglu et al.[2] These investigators had also detected that serpentine and amphibole (tremolite) asbestos, as well as talc, all having no economic value, were also present in the above mentioned places.[3] Malignant pleural mesothelioma, is one of the major health problems in Turkey today.[2] In our study, reporting some mesothelioma cases, we aimed to detect the epidemiological, histological, radiographic, and laboratory findings of patients, and to detect where asbestos exposure exists, especially in new places.

The findings of 201 patients with MPM between January 1990 and June 2005 were studied retrospectively. Using a standardized data collection instrument, case records of all the patients with MPM, diagnosed at Dicle University Hospitals were reviewed. Findings of standard chest radiography (CXR), taken during hospitalization were compared to findings of CT. Pleural biopsies were obtained using Ramel's needle. The pathologic diagnosis was made based on ordinary tissue sections, stained with hematoxylin and eosin. In some cases, different immunohistochemical stains were used to determine histological subtypes. Video-assisted thoracic surgery, was applied when cytological examination of the pleural effusion or histopathological examination of the pleural biopsy specimen was insufficient for diagnosis.

Out of the 201 patients, there was 122 (60.7%) men, and 79 (39.3%) women. The mean age was 52.4 (21-82), 55.8 for women and 50.8 for men. The male-female ratio was 1.5/1. The tumor was right-sided in 110 patients (54.7%), left-sided in 75 patients (37.3%), and bilateral in 16 (8%). The characteristics of pleural effusion were recorded in 180 cases, being serous in 106 (58.8%), serosanguineous in 45 (22.4%), and hemorrhagic in 29 (14.4%). Approximately 119 (59.2%) were detected to come from places where environmental asbestos exposure was known to be present previously. As the patients had been exposed to asbestos from birth, the latency period was equivalent to the age of the patients. Eighty two (40.8%) were detected to come from places where direct asbestos exposure had not been known to be present before. The mean interval between the onset of symptoms and the diagnosis was 160.5 days. The most common presenting symptoms were shortness of breath 88 (43.8%), chest pain 65 (32.3%), and cough 32 (15.9%). Signs compatible with pleural effusion were detected in 178 (88.6%) cases. Volume loss of the affected hemithorax in 94 (46.8%) and tenderness on the chest wall was detected in 48 (23.9%). Furthermore, clubbing in 15 (7.4%), and peripheric lymphadenopathy in 10 (5%) was noted as interesting findings. On laboratory findings, thrombocytosis was present in 75 (37.3%) of cases. The most common findings detected in the standard CXR performed during hospitalization, were pleural effusion in 149 (74.1%), pleural thickening in 94 (46.7%), and volume loss of the hemithorax in 65 (32.3%). Involvement of the interlobar fissure was 30 (14.9%) and mediastinal pleura was 46 (22.8%). A CT examination of the thorax was performed in 109 patients. The most common CT findings were ipsilateral pleural effusion in 84 (77.1%), diffuse pleural thickening (DPT) in 74 (67.9%), volume loss at affected hemithorax in 49 (45%), interlobar fissure involvement in 48 (44%), and mediastinal pleural involvement in 48 (44%). Furthermore, penetration of the lung parenchyma was detected in 22 (20.2%). Using a defined criteria and ordinary tissue stains, 85 cases were classified into the following histological subtypes: purely epithelial, 60 cases (70.6%);

mixed, 20 cases (23.5%); and sarcomatous, 5 cases (5.9%). Cytological examination was carried out in all patients who had pleural effusion. The diagnosis was established by cytological examination in 23 of them, whose pleural biopsy specimen was insufficient, but subgroup determination could not be achieved. The diagnosis was established by video-assisted thoracoscopy in 19 patients due to nondiagnostic or indeterminate results of samples taken by closed pleural biopsy. The diagnosis was established by cervical lymph node biopsy in one case. Thirty-eight cases had been subjected to bronchoscopy. Our cases per year are shown in **Table 1**. We found an increase in MPM patients till 1993. After 1993 - 2004; there is a significant decrease in MPM patients. Therapeutic approaches could be detected in 166 cases: 17 had surgical treatment (12 decortication and 5 extrapleural pneumonectomy), 106 treated with pleurodesis, 28 cases treated with chemotherapy, and 15 cases treated only with symptomatic treatment. The survival was followed-up in 156 cases. The mean survival duration was 9 months.

In a study from central Turkey, 23.9% of the mesothelioma cases declared no exposure to asbestos or erionite.[4] Balci et al[5] reported that 75% of MPM cases were from places where direct asbestos exposure was known to be present. Our rate was lower than the previous studies (59.2%). The living area of the cases with no exposure history and should be investigated for unknown asbestos sources. The value of direct CXR is not very high in MPM cases. Pleural effusion was not detected in 21 (10.5%) of our cases. The absence of pleural effusion was reported in 19% of all cases.[6] The most frequent findings are pleural effusion and 'pleural effusion + pleural thickening' in MPM cases. Pleural effusion covers the mass, and the diagnosis is not easy using only CXR. The duration between the first symptom and the diagnosis were found as 160.5 days in our study (7 days-18 months). The most frequent symptoms in MPM cases in the first admission are chest pain and dyspnea. In many cases, dyspnea related with restriction due to pleural fluid or pleural thickening, or both is found. In MPM cases, there is chest pain generally on the lateral chest wall, with a spreading character. Pleuritic pain is rare.[2] Similarly, in this series, dyspnea (43.8%), and chest pain (32.3%) were the most frequent symptoms on admission. Computer tomography is an important diagnostic tool for MPM cases. The earliest CT findings of MPM are atelectasia and pleural thickening with involvement of the interlobar fissures.[7] In our cases, the most common CT findings were ipsilateral pleural effusion and DPT. Involvement of interlobar fissure was reported in 66.7%.[2] Computer tomography has superiority, according to standard CXR for detection of the mediastinal pleura and interlobar fissure involvement.[2] In our series, involvement of interlobar fissure was detected more frequently with CT than in standard CXR (44% versus 14.9%). Similarly, CT was more effective than radiography in detecting of DPT in those cases (67.9% versus 46.7%). Treatment is generally unsatisfactory, and long-term survival is commonly not attained.[6] The median survival of MPM patients is approximately 12 months.[1] Likewise, the median survival of our cases was approximately 9 months.

In conclusion, MPM is an important health problem in Diyarbakir and preventive interventions are needed. In the diagnosis of suspected cases, CT has an obvious priority according to standard CXR for the detection of the disease. Cytological examination is not helpful in the majority of the cases.

Table 1 - Our cases per year.

Year	N	(%)
1989	3	(1.5)
1990	11	(5.5)
1991	16	(8)
1992	27	(13.4)
1993	30	(14.9)
1994	23	(11.4)
1995	23	(11.4)
1996	6	(3)
1997	6	(3)
1998	5	(2.5)
1999	7	(3.5)
2000	8	(4)
2001	7	(3.6)
2002	9	(4.4)
2003	11	(5.5)
2004	7	(3.5)
2005 (until July)	2	(1)
Total	**201**	**(100)**

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Role of methylprednisolone in unresolving cases of acute respiratory distress syndrome

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Ashbaugh et al[1] in 1967, described a syndrome characterized by refractory hypoxemia, diffuse lung infiltrates on chest radiograph, and decreased lung compliance in a group of 12 patients suffering from severe respiratory failure. Originally, this condition was named as Acute Respiratory Distress Syndrome of Adults. However, in 1971, the syndrome was renamed to what we now know as acute respiratory distress syndrome (ARDS).[1] The definition of ARDS has changed over time. Although, there are currently diverse opinions regarding the proper use of the term ARDS, all definitions of this syndrome include patients who meet the following criteria:[2] 1. Clinical evidence of respiratory distress. 2. Chest radiograph revealing diffuse bilateral airspace disease ("pulmonary edema"). 3. Oxygenation: a partial pressure of arterial oxygen to fractional inspired oxygen concentration ratio <200 mm Hg (regardless of PEEP) 4. Hemodynamic evidence of a pulmonary artery occlusion (wedge pressure <18 mm Hg). Acute respiratory distress syndrome, is a manifestation of acute injury to the lung, commonly resulting from sepsis, trauma, and severe pulmonary infections. Clinically, it is characterized by acute onset of dyspnea, profound hypoxemia, decreased lung compliance, and diffuse bilateral infiltrates on chest radiography. Acute respiratory distress syndrome, continues as a contributor to the morbidity and mortality of patients in the Intensive Care Unit throughout the world. During the last 10 years, there has been a decline in ARDS mortality.[3] Up to year 1990, many studies reported a mortality rate for ARDS of approximately 40-70%,[3] but 2 reports in 1990 from the UK, showed a decreased mortality rate ranging from approximately 30-40%.[3] The improved survival rate in recent times can be explained as the result of new strategies of handling the ARDS patients, such as, aggressive treatment of sepsis, low tidal volume mechanical ventilation, recruitment of alveoli, and corticosteroid therapy.[4]

The late phase of ARDS is often characterized by excessive fibroproliferation, leading to gas exchange and compliance abnormalities.[5] While corticosteroids are not effective in early ARDS, several case reports, and uncontrolled case series, and one small randomized controlled trial suggests that corticosteroids may be useful in the management of late-phase ARDS.[5] There are lot of pharmacological therapies used in trials to treat ARDS, and corticosteroids are one of many such therapies.[3] There has been only one prospective randomized trial, a pilot study of 24 patients, which suggested this therapy might be beneficial.[3] We present the outcome of 10 ARDS cases (**Table 1**), who received methylprednisolone therapy according to the Meduri protocol. All our patients had a pulmonary artery catheter, which confirmed the finding of non-cardiogenic pulmonary edema. Bronchoscopy with broncho-alveolar lavage was carried out to rule-out infection. Mechanical ventilation technique was adjusted to keep plateau airway pressure <30 cm H_2O and tidal volume was 6 ml/kg of ideal body weight. fraction of inspired oxygen (FiO_2) and positive end-expiratory pressure (PEEP) were adjusted to keep saturation equal to or greater than 90%. There were 10 patients; 9 in medical and one in surgical; 6 are males and 4 females, the average Apache II score of all patients was 26.3. The age was ranging from

Table 1 - Demographic data of patients.

No.	Age/ Gender	Primary Diagnosis	Final Diagnosis	PCWP	PO_2/FiO_2 Ratio	CXR	No. of days on ventilator	BAL	Inotropes	Extubated after steroid therapy
1	19/M	SCD, pneumonia	Pneumonia, septic shock, ARDS	14	121	Bil. Infil	13	S	Yes	4 days
2	29/M	Pancreatitis	Pancreatitis ARDS	13	137	Bil. Infil	12	S	No	3 days
3	45/F	Pneumonia, DM, IHD	Pneumonia, sepsis, ARDS	17	146	Bil. Infil	11	S	No	4 days
4	63/M	Pancreatitis	Pancreatitis, sepsis, ARDS	17	111	Bil. Infil	13	S	Yes	5 days
5	19/M	SCD, pneumonia	Pneumonia, sepsis, ARDS	14	186	Bil. Infil	14	S	Yes	4 days
6	39/F	Post op perforated DU repair	Sepsis, ARDS	16	149	Bil. Infil	16	S	No	5 days
7	51/F	SCD, pneumonia	Pneumonia, ARDS	14	118	Bil. Infil	15	S	No	6 days
8	51/F	RTA lung contusions	Sepsis, ARDS	16	188	Bil. Infil	14	S	Yes	4 days
9	23/M	Status epilepticus, pneumonia	Pneumonia, ARDS	12	179	Bil. Infil	18	S	No	5 days
10	44/M	Viral meningitis	Sepsis, ARDS	14	188	Bil. Infil	12	S	No	6 days

PCWP - pulmonary capillary wedge pressure, CXR - chest radiograph. FiO2/PO2 ratio: A partial pressure of arterial oxygen to fractional inspired oxygen concentration ratio, BAL - broncho-alveolar lavage, SCD - Sickle cell disease, Bil. infil. - bilateral infiltrates, DM - diabetes mellitus, S - sterile, IHD - ischemic heart disease, DU - duodenal ulcer, ARDS - acute respiratory distress syndrome, RTA - road traffic accident

19-63 years. Out of 10 patients, 4 required inotropic support, to maintain hemodynamic stability. The broncho-alveolar lavage of 10 patients was sterile. The average number of days where patients remained on mechanical ventilator before steroid therapy, was 13.8 days and the average time taken to extubate the patients after steroid therapy was 4.6 days. Ventricular perfusion scans were negative in all 3 sickle cell disease patients for pulmonary embolism (**Table 1**).

The thought process behind the use of steroids in ARDS has been the fact that ARDS presents an overwhelming inflammatory response in the lungs. Steroids will block this response to a great degree. However, whenever steroids are used, immunosuppression occurs. These patients are at high risk for nosocomial infections, and a steroid use clearly increases morbidity and mortality from these infections. However, death from ARDS is associated with an inappropriate fibrotic response in the lung, which also can be blocked by steroids. Glucocorticoids also suppress the synthesis of phospholipase A2, cyclooxygenase 2, and nitric oxide synthetase 1 genes, decreasing the production of prostanoids, platelets activating factor, and nitric oxide, which are the 3 key substances in the inflammatory pathway,[6] and have an inhibitory effect on fibrogenesis. Although previous large prospective trials failed to show a benefit of steroids in early ARDS, small reports recently describe improved survival in patients with late ARDS.[5] Steroid therapy has long been a controversial issue in the treatment of ARDS.[3] A meta analysis of 9 published studies concluded that, early high-dose steroid is not beneficial for ARDS.[3] It has been suggested in a randomized, double-blinded, placebo-controlled study, however, in late unresolving ARDS, long term methylprednisolone was associated with significantly improved lung function and early extubation, and with reduced mortality in both ICU and the hospital.[3]

In conclusion, looking into the outcome of the prospective study by Meduri et al[3] and the results following the same protocol, methylprednisolone therapy should be reevaluated and considered as promising therapy for ARDS.

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Cross-leg fasciocutaneous flaps. *Still a valid option for reconstruction of traumatic lower extremity defects*

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Reconstruction of defects of the lower third of the leg and foot represents a great challenge for plastic surgeons, especially when the defect is large. The reduced vascularity and subsequent poor healing encountered in these regions, as well as the limited availability of local tissue for reconstruction, demands a careful evaluation of the wound, and detailed knowledge of the local anatomy to select the best surgical procedure for each patient.[1] Cross-leg flaps described by Hamilton in 1854, were used widely to save limbs, but nowadays, they are considered by many as obsolete and "awkward" procedures.[2] However, the last decades have witnessed many surgeons using different types and modifications of cross-leg flaps as a primary, or as a salvage procedure, following failure of previous attempts at lower limb reconstruction.[2] The objective of this retrospective review, is to evaluate our experience at the Jordan University Hospital, in using cross-leg fasciocutaneous flaps for reconstruction of large defects of the lower third of the leg and foot regarding the outcome and complications.

A chart review, was conducted on 12 patients who underwent cross-leg fasciocutaneous flaps for reconstruction of large lower leg and foot defects between 1998 and 2005 at the Jordan University Hospital, Amman, Jordan. The medical records of these patients were reviewed for demographics, wound size, etiology, location, procedures performed, complications, healing time, and further revision surgery related to the repair. Nine of the patients had a post traumatic defect induced by motor vehicle accidents, 2 patients had defects resulted from crushing by heavy objects, and one patient had a large full thickness burn. The flaps were proximally based on the axial blood supply of the posterior descending subfascial cutaneous branch of the popliteal artery, and raised from the posterior aspect of the contra-lateral leg. The donor site was closed either primarily or with skin graft (**Figure 1**). The limbs were fixed by plaster of Paris cast. A window was created in the cast opposite of flap for future inspection. The average time between flap coverage and division was approximately 20.8 days (range 18-23 days).

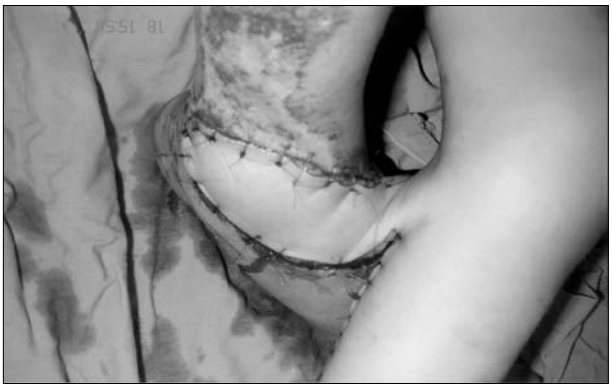

Figure 1 - The flap sutured to the recipient site.

Twelve patients (8 males and 4 females) were included in the study with a mean age of 10.3 years (range 0.3-30 years). The time between injury and repair range approximately 5 days to 4 years. The site of defect was the lower third of the leg in 5 patients (41.6%), dorsum of foot in 4 (33.3%), heel in 2 (16.6%), and the big toe in one patient (8.3%). Seven patients (58.3%) had compound fractures with bony exposure, 3 patients (25%) had bony exposure without fractures, and 2 patients (16.6%) had exposure of dorsal extensor tendons. Two patients (16.6%) received non-vascularized bone grafts to replace the bone loss; one graft was harvested from the opposite fibula; and the other one from the iliac crest. The mean size of the defect was 59.3 cm^2 (range 27-120). The mean time between repair and flap division was 20.8 days (range 18-23). All the patients were discharged from the hospital with viable flaps after the procedure. The mean follow-up period was 37.6 months (range 2-71). One patient (8.3%) had partial flap loss that healed later by dressings in the out patient clinic. Two patients (16.6%) with heel defects (in the weight bearing area) developed recurrent ulceration and hyperkeratosis that required further reconstruction. Four patients (33.3%) required

Table 1 - Operative data and complications.

Data and complications	N	(%)
Period from injury to repair (range)	(5 days - 4 years)	
Operative time in minutes: mean (range)	92.1	(55-165)
Donor site repair		
Split-thickness skin graft	3	(25)
Full-thickness skin graft	8	(66.7)
Primary repair	1	(8.3)
Time for repair to flap division in days: mean (range)	20.8	(18-23)
Complications		
Partial flap necrosis	1	(8.3)
Wound infection	0	(0)
Joint stiffness	0	(0)
Recurrent ulceration and hyperkeratosis	2	(16.6)
Minor flap revision or thinning	4	(33.3)

minor flap revision for better cosmesis. All the other patients maintained durable soft tissue cover with satisfactory esthetic results. None of the patients had wound infection or joint stiffness (**Table 1**).

Management of traumatic lower limb soft tissue defects, remains a major challenge to plastic surgeons. The beginning of microsurgery in the 1970s, and the introduction of myocutaneous and fasciocutaneous flaps by Ponten[3] in 1981, have revolutionized the reconstruction of lower extremity defects. Free flaps using the microsurgical techniques, have been used successfully to cover acute and chronic large lower extremity defects.[4] However, free flaps require special skills and relatively expensive instrumentation not readily available to all reconstructive surgeons, particularly in the developing countries. Moreover in serious cases, free flaps are highly risky or even difficult to perform.[2] The other alternative is to use local fasciocutaneous and muscle flaps. This option however, may not also be achievable due to the absence of adequate healthy local tissues. In such circumstances, the use of cross leg fasciocutaneous flaps offers a valid alternative to free flaps or local flaps. The major drawbacks of this procedure include an unreliable blood supply, limited arc of rotation caused by a short and thick pedicle, and the need for inconvenient postoperative immobilization.[2] Some surgeons used external fixation devices to achieve better patient convenience and joint mobility, in addition to facilitating flap monitoring and wound care. The optimal time for flap division has not been determined in the literature; Thatte et al[5] divided 10 cross-leg fasciocutaneous flaps on the tenth days without complications. George et al[6] used a simple occlusion clamp with screws to apply gradual tightening at the pedicle, producing intermittent periods of ischemia, they could divide the flap safely after 9 to 14 days (mean 10 days). However, in this series, all flaps were divided after 18 days. The facilities for free tissue transfer in our center, like most of the centers in the developing countries are still lacking. We depend mainly on cross-leg posterior tibial fasciocutaneous flaps to repair defects of the lower leg and foot. Only 9% of our patients in this series had partial flap necrosis, which compares well with the rate of partial or complete flap loss reported by other series (0-26.9%).[2-6] Soft tissue defects in weight bearing areas, such as the heel regions, have long been viewed as troublesome due to the continuous pressure load, and the special anatomical nature of these areas. Two patients with heel defects (16.6%) in this series had recurrent ulcerations following cross-leg flaps.

Cross-leg flaps, are still safe and reliable method for soft tissue reconstruction of traumatic lower extremity defects. They should be viewed as a viable alternative for wounds with extensive exposure of bone and tendon. These flaps provide similar tissue to that lost, they are easy to raise, require short operative time, are associated with minimal blood loss, and they preserve the major arteries in the traumatized leg.

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Outcome of occlusion treatment for strabismic amblyopia in children below 12 years old

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Amblyopia refers to a decrease of vision, either unilaterally or bilaterally for which no cause can be focused by physical examination of the eye (no evidence of organic eye disease). Most vision loss from amblyopia is preventable or reversible with the right kind of intervention.[1] Amblyopia has a high risk of becoming blind due to potential loss to the sound eye from other causes. Treatment of amblyopia by occlusion has been described for more than 200 years and remains the accepted treatment.[1,2] The incidence of amblyopia caused by strabismus in Qatar is not known. In this study, we aimed to determine the outcome of occlusion treatment given for strabismic amblyopia, and analyze which factors affect the outcome in Qatari children.

This is a retrospective study based at Hamad General Hospital, Doha. This hospital provides comprehensive tertiary health care services for all the residents residing in the State of Qatar, and this is the main tertiary-care center in the country. All strabismic amblyopia cases are treated in this hospital. We collected data retrospectively from the medical records of Qatari children below 12 years who were treated with occlusion therapy for strabismic amblyopia at Hamad General Hospital from 1992-2002. Amblyopia was defined as at least 2 Snellen lines difference in visual acuity. The inclusion criteria were strabismus amblyopia with and without anisometropia. Anisometropia was defined as a difference in refractive error between 2 eyes of one diopter or more. Exclusion criteria were pure anisometropic amblyopia, organic amblyopia, deprivation amblyopia, and patients with nystagmus or mental delay affecting the accuracy of visual acuity testing. We analyzed the following risk factors; refractive error and anisometropia, age at presentation, age at initiation of treatment, vision at initiation of treatment, type of occlusion and compliance. Compliance was determined by orthoptist comment as having good or poor compliance. As strabismus is diagnosed early, no accurate measurement of initial visual acuity by Snellen charts can be obtained in some patients, and we need to determine the fixation pattern as alternate or poor. The outcome of the treatment was determined by final visual acuity, which was tested using Snellen charts. We classified the patients into 2 groups: Good group with visual acuity of 6/9 or more, and poor group with visual acuity of less than 6/9. Student's t-test, Chi-square, and Fisher exact test were performed, and the level $p<0.05$ was considered as the cut-off value for significance.

During the study period, we identified 38 patients, 15 boys and 23 girls. Of these, 29 patients (76.3%) had strabismus, and 9 patients (23.7%) had mixed strabismus and anisometropia. Their age at presentation, ranged from less than one up to 8 years. All patients received occlusion therapy, full time (18.4%) and part time (81.6%). There were 28 children in the good outcome group, and 10 in the bad outcome group. **Figure 1** shows the final visual acuity in the amblyopic eye after the treatment on discharge: 73% achieved 6/9 or better, 26% achieved less than 6/9. **Figure 2** shows the percentage of patients with different final visual acuity for strabismus, and strabismus associated with anisometropia. Stigmatism in the good outcome group was 57%, and 60% in the poor outcome group ($p=0.642$). Hypermetropia was present, 85% for the good outcome group, compared with 90% for the poor outcome group ($p=0.928$). The mean age at presentation for the good outcome group was 3.46 years (SD 1.5) and for the poor outcome group was 4.05 years (SD 2.01); ($p=0.34$). Some patients had a Snellen acuity measurement prior to the start of the treatment, and it was found that poor initial visual acuity appears to be significantly higher among the poor outcome (70%) compared to the good outcome group (17.9%) ($p=0.005$). In 15 patients, fixation pattern was recorded as alternate or poor, in which a measurement of initial visual acuity could not be obtained in those patients, 9 patients were recorded as having alternate fixation and all of them had good outcome. Poor fixation was recorded in 6 patients, 2 of them had good outcome and 4 patients had poor outcome. There was a significant association between compliance and final visual acuity (as recorded by the orthoptist). Patients in the good outcome group had a significantly better compliance than those in the poor outcome group ($p<0.001$). In the good outcome

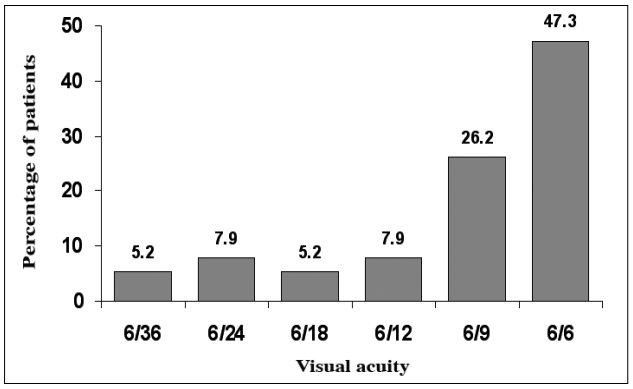

Figure 1 - Final Visual acuity in the amblyopic eye on discharge.

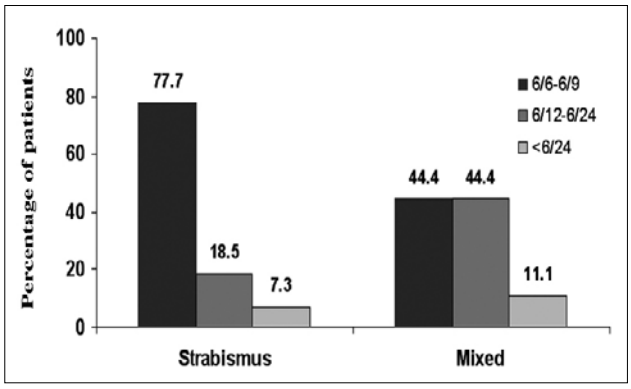

Figure 2 - Percentage of patients with different final visual acuity for strabismic and mixed amblyopia.

group, 100% (n = 28) were recorded as having good compliance, whereas in the poor outcome group, only 50% (n = 5) were recorded.

In our study, poor outcome was significantly associated with those patients who had a full time occlusion (p=0.003). Full time occlusion was prescribed in 7.1% (n = 2) of the good outcome group and 50% (n = 5) of the poor outcome group. Overall, 73% of the patients in our study achieved 6/9 or better visual acuity. This was better than 48% reported by Woodruff et al[3] and 40% reported by Hiscox et al.[4] We found a significant association between compliance and final visual acuity, as reported by others.[4,5] It was reported to be the most critical factor for successful outcome by Lithander and Sjostrad,[6] they suggested that with ideal treatment and generous resources, a success rate of nearly 100% can be aimed. However, in our study, the compliance was more difficult when visual acuity is poor, so we prefer to start with part time occlusion, then increase to full time according to the patient's response and tolerance. Our results are encouraging, and we suggest that occlusion treatment should be started early and aggressively, as occlusion therapy is still the widely used and effective method of improving vision with maximum effect in the first 3-6 months of occlusion treatment. We should plan for an occlusion regimen that provides care and motivates support to the child and parents, especially at the start of treatment.

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