EXTERNAL CEPHALIC VERSION AS A PRIMARY OPTION IN THE MANAGEMENT OF UNCOMPLICATED SINGLETON TERM BREECH PREGNANCY: IS IT WORTHWHILE?

By

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V ABBREVIATIONS

ABG	Arterial Blood Gas
ACOG	American College of Obstetrics and Gynecology
AFI	Amniotic Fluid Index
BMI	Body Mass Index
CTG	Cardiotocograph
ECG	Electrocardiograph
ECV	External cephalic version
EFW	Estimated Fetal Weight
FHR	Fetal heart rate
FMH	Fetomaternal haemorrhage
HKB	Hospital Kota Bharu
HUSM	Hospital Universiti Sains Malaysia
ICU	Intensive Care Unit
LSCS	Lower Segment Caesarean Section
MCH	Maternal and Child Health
MMR	Maternal Mortality Rate
NICU	Neonatal Intensive Care Unit
RCOG	Royal College of Obstetrics and Gynaecology
SMS	School of Medical Sciences

SVD	Spontaneous Vertex Delivery
USG	Ultrasonography
USM	Universiti Sains Malaysia
VBD	Vaginal Breech Delivery

VI INTRODUCTION TO THE STATE OF KELANTAN

To discover the soul of Malaysia, one should visit the state of Kelantan, bordered by Thailand on the north, isolated from the west by a chain of rugged mountains and separated from the south by the oil rich state of Terengganu. The east coast state of Kelantan's exquisite silver artisan, cloth and mat weavers, and batik weavers are renowned throughout the countries. And where else but in Kelantan that you can see farmers competing in top-spinning and kite- flying, as well as watch fisherman with their beautifully painted boats pushing or landing at the same stretch of beach that has been unchanged since centuries. Peaceful, timeless fishing villages dotted the coastline, coconut palm bending out to the blue sea are common scenery that will tranquilize you as you passed the quiet coastal road in the coastal area of Kelantan.

History: Kelantan has a long story of independent existence going back to it's own history. Kelantan's earliest known history dates back to the Middle Stone age between 3000 and 8000 B.C. Chinese historical report the existence of city-states or kingdoms in the east coast of the Malay Peninsula which maintained contacts with the Chinese court. The Chinese called what probably ancient Kelantan, "Ho-lan-tan" during the 5th century. Cave dwellers once roamed its

interior, this important trace has been found at various places in the state, which later emerged as an important kingdom in the days of the Malaccan sultanate and was ruled by the legendary beauty, Puteri Sa'adong, in the 17th Century. When Islam came to the Malay world, Kelantan become one of the earliest Muslim states in the region. This was based on the finding of gold coin at Kubang Labu which on one side was written in Arabic " Al-Julus Kelantan " (seat of Kelantan Government) and on the other side, the date 577 Hijrah (about 1180 A.D). In the more modern times, Kelantan was under the shadow of its powerful northern neighbour, Thailand, and Thai or Siamese influence did not come to the end until a treaty, signed in 1909 between the Thais and the British that placed Kelantan under British protection. Kelantan was under British indirect rule as a protected state till 1941. On the 8th of December 1941, the Japanese invade South Thailand and Kelantan before advancing to the south to capture Singapore. From December 1941 to September 1945, Kelantan was under the ruling of Japanese. Following the Japanese surrender in August 1945, British took over the ruling. In 1948, Kelantan become part of the Federation of Malaya, which gained its independence on 31st August 1957. However, Thai influences can still be seen in the Kelantan architectures, dialect, food and art forms of today. Kelantan is a place to explore. Do not hesitate to travel off the beaten track to a small fishing village. A friendly gesture will be the return of a smile, or

perhaps to an invitation to tour the village where the soothing rhythms of a Malay life have endured for centuries.

The state: Kelantan is situated in the northeastern part of Peninsula Malaysia and covers a land of 14,922 square kilometers with 1,215,950 inhabitants. The state of Kelantan is one of the thirteen states in Malaysia. Kelantan consists of ten districts namely Kota Bharu, Bachok, Machang, Pasir Puteh, Pasir Mas, Tanah Merah, Tumpat, Kuala Krai, Jeli and Gua Musang. The state capital, Kota Bharu is located at the bank of the Kelantan River and situated 627 kilometres from the Federal Capital, Kuala Lumpur. It was granted the title " Darul Naim" which means " the peaceful state" in July 1916.

Its people: The population of Kelantan is just over a million people in the last population census done in 1990, with an annual growth rate of 2.5%. The distribution of the population differs from one district to another with 86% of the population living in the northern districts (except Kuala Krai and Gua Musang) which contribute only about 26% of total land area. The majority of its population is predominantly Malay, which constitute 93%, while the Chinese, Indian and the Siamese makes for the other 7% of the total population. The Malay traditionally lives in the outskirts of the town areas, kampong and the coastal villages, while the Chinese and Indian are mostly concentrated in the town areas.

Economy: Kelantan gross economic product has grown steadily. The GDP grew from RM. 1,463 million in 1985 to RM. 2,485 million in 1993.This growths has been attributed to a strong commitment by both the public and private sector. The per capita income in 1995 is RM. 2,081. The economic growth rate for 1994-95 is 6.4%. Agriculture and fishing industries form the backbone of the Kelantan economy. It accounts about 35% of the state GDP in the past years. The opening of East-West Highway, bringing Kelantan into closer contact with the west coast, promises to accelerate the state's economic development.

Tourism: With its rich cultural and traditional heritage, Kelantan is one of the most interesting and unique destinations for a vacation. The long stretches of clean sparkling white virgin beaches, with the blue seas in the background are great for swimming and picnic. Kelantan's traditional pastimes games of top spinning, kite flying, drum beating and traditional singing (dikir barat) is well and alive in spite of the modernization of its people. The handicraft are superb for example the hand printed ***batik*** cloth, ***songket*** and exquisite silverware are renown and popular with the tourist, whether local or foreign. The craftspersons of Kelantan are truly gifted and skilled which is a tribute to Kelantan's rich cultural heritage and liven to its ' **soul of Malaysia**' reputation.

VII MATERNAL HEALTHCARE IN KELANTAN

Nineteen thirties saw the beginning of maternal healthcare in the state of Kelantan with the building of their first General Hospital. Midwife training was initiated then with its upgrading in 1946. Ten years later, the National Rural Health Development started extensive development of health infrastructure facilities program. Programs in the form of Rural Health Units were organized on a 3-tier system of referral for Maternal and Child Health (M.C.H.) care.

The 2nd Malaysian Plan (1971-1975) decided to change the 3-tier system (1 Main Health Center for 50 000 population, 1 Sub Health Center for 10 000 population and 1 Midwife clinic for 2 000 population) to a 2-tier system, which consists of 1 Health Center for 20 000 populations. The various maternal health cares provided free of charge by the government including antenatal care, domiciliary midwife, postnatal care and family planning. Despite the provision of all these facilities, problems arose during the domiciliary intrapartum period. Up to this day the role of the Kampong Tok Bidan (Traditional midwifes) regains supreme amongst the predominantly rural thinking community.

Over the past ten years, the state's medical and health services have improved tremendously with the opening of district hospitals and health centers along with

substantial social, educational and economic improvement. The medical and health services for the state are provided by nine hospitals; 2 in Kota Bharu district and one each in each district except for the district of Bachok and Jeli. There are also 55 government Health Clinics (Klinik Kesihatan) and 230 Government Health Clinics (Klinik Desa).

The Kota Bharu General Hospital (HKB), which is located in the state capital of Kota Bharu was the only referral center for the state and the northern part of the adjoining state of Terengganu till 1984, when Hospital Universiti Sains Malaysia (HUSM) began to function. The department of Obstetrics and Gynaecology of HKB become a part of HUSM from the 15th of July 1985 and subsequently moved back to its former premises at the General Hospital on the 1st of January 1989 and now functions as a sister hospital to the University Hospital.

Improvement of medical and health services in the state is clearly reflected by the increasing number of hospital deliveries, reduction in perinatal mortality and maternal mortality. The maternal mortality rate (MMR) in Kelantan has declined from 1.1 per 1000 live births in 1980 to 0.55 per 1000 live births in 1995. There were 24 maternal deaths in 1993, 19 in 1994 and 18 in 1995. The districts with the higest mortality rates were Kuala Krai and Machang. The rates were also

high in Pasir Mas and Gua Musang in 1993 but in 1995 the rates in both districts dropped to 0.

The perinatal mortality rate per 1000 live birth in Kelantan had dropped from 22.76 in 1985 to 12.92 in 1994, in comparison to the state average, districts of Gua Musang, Kuala Krai, Tanah Merah, Jeli, Pasir Mas and Tumpat had higher perinatal mortality rate in1994.

VIII THE HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)

Universiti Sains Malaysia (USM), the third university in Malaysia was established in 1969 in Penang. Subsequently, in 1983 and 1985 it set up two branch campuses, the first in Kelantan followed by the second in Perak. USM Perak Branch houses the various schools of engineering while USM Kelantan Branch; to date has its School of Medical Sciences (SMS) and the Hospital Universiti Sains Malaysia (HUSM) which acts as a teaching hospital.

From the beginning and true to its name, USM is given the mandate to provide, promote and develop higher education in the fields of Natural Sciences, Applied Sciences, Pharmaceutical Sciences, Building Science and Technology, Social Science, Humanities and Education. Emphasis is given to research and advancement of knowledge and the dissemination of such knowledge in these fields of study. The University has not departed from these terms of reference and is proud of its innovative approach in tertiary education.

This campus started to develop in 1983 when the Ministry of Health Malaysia handed over a newly completed hospital Building to USM to act as a teaching hospital for its medical undergraduates. Then the campus only accommodated the 4th and 5th year students, and academic staff from the clinical disciplines.

Year 1, 2 and 3 students remained in the Main Campus in Penang together with their lecturers and the administrative machinery of the School. The medical complex, the sports complex and the animal house were built under Phase 1 Project. This project was completed in April 1990 and in June the same year the whole School of Medical Sciences moved from the main campus to the subcampus. This move marked the beginning of the administrative machinery of Universiti Sains Malaysia Cawangan Kelantan (USMCK).

USMCK is situated on 72.84 hectares of flatland in the suburbs of Kota Bharu and has the potential to expand and develop. The presence of USMCK in Kubang Kerian has activated commercial and housing industries. This once quiet suburb of Kota Bharu is planned to be the satellite town in the near future.

A Director whose authority is handed down from the Vice Chancellor administers this branch campus. The Director as the chief administrator is responsible to coordinate all administrative and academic matters to ensure the smooth running of this campus.

To assist him in these administrative and managerial functions, all supporting departments at the main campus have set up their branches here. In the day-to-day operations these branch departments are directly answerable to the Director

while adhering to policies set by the headquarters. Since the inceptions of this campus, the various branch departments set up are the Registry, Bursary, Development (Engineering), Security, Medical Library, Computer Center Branch, Language Unit, and the Students' Affair Division.

To people in the street, HUSM is better known than any other component of this campus. This may be due to the fact that the hospital building was the first landmark of the campus or because of its direct involvement with the community. HUSM is headed by a Director and assisted by two Deputy Directors. The various heads of department and heads of units also assist him.

The Hospital opened its doors to patients in October 1983. It provides medical services like any other hospitals in the country but unlike the others it also acts as a teaching hospital for the medical and dental undergraduates and post graduates, and final year pharmacy students of USM.

With the presence of specialists and consultants in the various fields of medicine and related disciplines it is able to be the referral center for the East Coast states of Peninsular Malaysia.

Services offered by HUSM can be categorized into two, namely the outpatient Service and the In - Patient Service. Outpatient Service consists of:

1) Community Medicine Clinic that is open on all working days from 08.10 to 16.40.

2) Specialist Clinics that are open from Saturday to Wednesday and see cases by referrals and appointments.

3) Accident and Emergency Unit that is open round the clock to attend to all kinds of urgent cases.

In-Patient Service provides treatment in one of the 28 wards of HUSM. The wards are divided into various disciplines like Obstetrics and Gynecology, Surgery, Orthopedic, Psychiatry, Ophthalmology, Otorinolaryngology, Pediatric, Medical, Oncology, ICU, CCU and NICU. There are a total of 675 beds.

At the moment, a five storey building meant for dental faculty is in progress.

As a teaching hospital and a referral center, HUSM undertakes to provide the best, in patient service. Specialists who are also lecturers of SMS act as consultants to all cases in HUSM.

Support services come from the many departments and units that make up this Hospital. Services from the Radiology Department, Nuclear Medicine Unit, and laboratories help doctors decide the best treatment regime for patients. The blood bank supplies blood and blood components as well as other hematological tests and screening. The Therapy Unit and the Haemodialysis Unit provide the necessary therapies for certain patients. The Dietetics Unit prepares food for all in-patients and does diet counseling service. The laundry Unit ensures constant supply of linen to the wards while the Housekeeping Unit is responsible to the cleanliness of all general areas in the hospital.

IX THE DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

In year 2000, the department of obstetrics and Gynecology was staffed by ten consultants / lecturers, eight registrars (final year masters students), fifteen medical officers / trainee lecturers (11 third year and one second year and three first year master students) and seven house officers. The postgraduate program was started in 1991 and the first Master of Medicine candidates graduated in June 1995.

Since 1995 the department of Obstetrics and Gynaecology occupied the first and second floors of the main hospital building. There were two gynaecology wards on the second floor with 56 beds and two obstetrics wards on the first floor with 72 beds.

The department had a major transfer on 27th June 1997. The new block has a Labour Room, the antenatal ward and the postnatal ward. The Labour Room (1 Berlian) is currently on the first floor of the new block. It consists of 8 labor suites, 1 admission room, 2 bedded pre eclampsia room for patients requiring intensive care, 2 bedded premature Labor Room, 1 operating theatre and 1 ultrasound room. This floor becomes fully operated in June 28 1997.

The Labor Room is equipped with an ultrasound machine, five cardiotocography (CTG) machines, dynamaps, ECG monitors, infusion pumps, two resuscitation trolleys and central oxygen supply and blood warmer.

Adjacent to the Labour Room is neonatal resuscitation room which is equipped with a resuscitation trolley, warmer and incubators. There is an operation theatre situated within the Labour Room, which is opened during office hours for emergency obstetrics procedures such as caesarean section and repair of third and fourth degree vaginal tear or cervical tear and manual removal of placenta.

There is an anaesthetic medical officer posted to the Labour Room during office hours to provide epidural services and emergency procedures. The Neonatal Intensive Care Unit (NICU) is located behind the Labour Room and is equipped with facilities for the care of problem newborns.

There is one registrar and one medical officer in charge of the Labor Room during office hours. After office hours the on call team takes charge of managing the patients in the Labour Room.

Table IX.I Basic Statistic of Obstetrics and Gynaecology, Hospital University Science of Malaysia.

Year	1995	1996	1997	1998	1999	2000
Total Deliveries	8804	7669	7712	6930	7778	7487
Mode of Deliveries(%)						
1) SVD	80.1	79.3	79.3	81.1	82.6	82.7
2) Vaccum	2.9	3.4	2.9	2.2	2.4	1.2
3) Forcep	1.2	1.5	1.8	1.1	1.0	1.1
4) CS	11.3	10.7	12.4	13.6	11.8	11.6
5) Breech	2.7	2.8	2.6	2.1	2.0	2.4
6) Twin	1.0	1.0	1.0	0.9	1.2	1.0

The antenatal wards (2 Baiduri and 2 Arked) are situated on the 2nd floor and has 20 beds each and the postnatal ward (2 Topaz) has 40 beds. The gynaecology wards were shifted to the 1st floor of the old hospital block and have a total of 62 beds.

The obstetrics and gynaecology clinic are situated on the ground floor of the same building and is equipped with two-ultrasound machines and a colposcope. The clinic runs as follows in Table IX.II.

Table IX.II O&G Clinics Schedule in HUSM

DAY	MORNING	AFTERNOON
Saturday	Booking Antenatal Clinic	Booking Antenatal Clinic
Sunday	Antenatal Outpatient Clinic	Gynaecology Outpatient Clinic
Monday	Menopause Clinic Combined Clinic Outpatient Ultrasound	Molar and Oncology Clinic
Tuesday	Antenatal Outpatient Clinic	Gynaecology Outpatient Clinic
Wednesday	Fertility Augmentation Clinic	Postnatal Clinic
Thursday	Staff Pap Smear Clinic	Department Presentation

The doctors are divided equally into four teams to manned these clinics as well as the wards and duties during normal working days as well as on call days. This system had been well accepted.

Table IX.III The Number of Outpatient Seen from 1995 till 2000

YEAR	GYNAECOLOGY OUTPATIENT	OBSTETRIC OUTPATIENT
1995	4174	10296
1996	4725	10146
1997	5319	11741
1998	5666	11826
1999	6026	9854
2000	5945	9144

X ABSTRAK

LATAR BELAKANG: *Pilihan tentang cara kelahiran terbaik untuk pesakit-pesakit dengan kedudukan bayi songsang sering menimbulkan kontroversi. Salah satu alternatif adalah dengan melakukan prosedur ECV, iaitu suatu proses memanipulasi abdomen ibu dengan tujuan untuk membetulkan kedudukan bayi. ECV merupakan suatu prosedur yang disarankan kerana mempunyai dalil saintifik perubatan yang kuat, akan tetapi ia tidak dilakukan secara meluas dalam rutin harian.*

OBJEKTIF: *Untuk menilai kadar kejayaan ECV, untuk melihat faktor-faktor apakah yang boleh mempengaruhi kadar kejayaan tersebut dan juga untuk melihat pola proses kelahiran setelah pesakit menjalani prosedur ECV.*

METODOLOGI: *Kajian dilakukan secara prospektif di Jabatan Perbidanan dan Sakit Puan, Hospital Universiti Sains Malaysia selama satu tahun. Terdapat 278 kes yang dikaji, 240 kes tidak menjalani ECV manakala 38 kes menjalani ECV.*

KEPUTUSAN: *Kadar kejayaan ECV secara keseluruhan adalah 60.5 peratus; manakala untuk kandungan pertama adalah 44 peratus dan untuk kandungan kedua dan seterusnya adalah 65 peratus. Di antara faktor-faktor yang mempunyai kesan yang signifikan dari segi statistik adalah posisi belakang bayi di sebelah kiri ibu berbanding*

dengan posisi belakang bayi di sebelah kanan ibu (p = 0.002) dan lokasi uri di depan mengurangkan kemungkinan kejayaan ECV secara signifikan dari segi statistik (p = 0.029). Manakala faktor-faktor lain seperti operator ECV, posisi kaki bayi (jenis songsang), kadar obesiti dan penggunaan ubat 'tocolysis' didapati tidak mempunyai pengaruh yang signifikan dari segi statistik terhadap kadar kejayaan ECV. Di antara kedua-dua kumpulan, yang menjalani ECV dan yang tidak menjalani ECV tidak terdapat perbezaan yang ketara dari segi 'Apgar Score' 5 minit dan juga dari segi kadar kemasukan ke Unit Rawatan Intensif Neonatal. Dari sejumlah 23 kes dimana ECV telah berjaya, 20 daripadanya (87%) melalui proses kelahiran normal manakala 3 daripadanya (13%) terpaksa menjalani kelahiran melalui pembedahan atas indikasi obstetrik.

KESIMPULAN: *ECV merupakan alternatif yang terbukti mempunyai kelebihan dan ianya perlu diberi pertimbangan yang sewajarnya dalam menangani kes bayi songsang yang tidak ada komplikasi. Kadar kejayaan ECV adalah 60.5 peratus. Di antara faktor yang mempengaruhi kejayaan prosedur ini adalah posisi belakang bayi di sebelah kiri ibu dan lokasi placenta. Pesakit yang berjaya dalam prosedur ini mempunyai peluang yang lebih tinggi untuk bersalin secara biasa. Tidak terdapat perbezaan yang ketara dari segi hasil perinatal di antara kumpulan yang menjalani ECV dan kumpulan yang tidak menjalani ECV.*

XI ABSTRACT

INTRODUCTION: The mode of delivery for breech presentation is controversial. ECV as one of the alternatives has support of good quality evidence; despite that it does not seem to have been taken into routine clinical practice in our hospital.

OBJECTIVES: To determine the outcome of external cephalic version, to evaluate the factors affecting the results of External Cephalic Version and to evaluate the delivery outcome of patients who had undergone External Cephalic Version.

METHODOLOGY: There were 278 cases studied, 240 cases without ECV and 38 cases undergone ECV.

RESULTS: Between these two groups there are no significant difference in terms of Apgar Score at 5 minutes and need of NICU admission. The overall success rate of ECV is 60.5%; whereas for primigravida is 44% and multigravida is 65%. Location of fetal back at the maternal left is associated with significant higher successful version rate compared to fetal back at maternal right ($P = 0.002$) , anterior placenta has significant lower rate for successful version ($p = 0.029$) however there are no significant differences in terms of operator of ECV, type of breech, body mass index and use of

tocolysis. Out of 23 cases who had successful version, 20 cases (87%) delivered SVD and 3 cases (13%) needed LSCS.

CONCLUSION: ECV is an accepted procedure and should be considered in an uncomplicated singleton term breech pregnancy. The success rate of ECV is 60.5%. The factors that have a significant prognostic predictive value are placental location and position of the fetal spine towards maternal spine. Successful version significantly increases the chance of the patients to have a vertex vaginal delivery. There were no difference in term of perinatal outcome between patients who undergone ECV and no ECV.

1 INTRODUCTION

The management of patients with breech presentation continues to be one of the most challenging problems in obstetrics. There are several factors associated with breech presenting fetus. These are uterine abnormalities, contracted pelvis, cornual placentation, placenta previa, oligohydramnios or polyhydramnios, abnormal baby, extended fetal legs, reduced activity of the fetus, impaired fetal growth, curtailed gestation and sometimes breech presentations appear to run in the families (Hellstrom et. al 1990, Hofmeyer et.al 1983). Breech presentation may be suspected when there is a history of subcostal discomfort, or a fetal kicking felt in the lower uterus. Abdominal examinaton of the lower portion of the uterus reveals a fetal pole which lacks the firmness and spherical outline of the fetal head, and the recess between the head and shoulders. This finding should be confirmed by pelvic examination to exclude a deeply engaged fetal head, as fetal shoulders may be clinically indistinguishable from the breech. The head may be identified in the upper uterine segment by means of ballottement; because of the flexibility of the fetal neck, the movement of the head through the amniotic fluid has the characteristics of a free spherical structure.

About 3- 4% of all deliveries present by the breech at term. The incidence is higher in earlier gestation; about 20% at 28 weeks, 15% between 29 – 32 weeks and 8% at 32 – 36 weeks. Spontaneous cephalic version occur with decreasing frequency towards the end of pregnancy. Westgreen et al. (1985) found the likelihood of spontaneous cephalic version after 32 weeks gestation to be 57 per cent and after 36 weeks 25 per cent. This was least for nulliparae and greatest for multiparae without a

previous breech birth. After 33 weeks the likelihood for spontaneous cephalic version is 16 per cent for nulliparae and 58 percent for multiparae. Spontaneous version is less likely in pregnancies with extended fetal legs and short umbilical cord and is unrelated to placental position.

A great variety of techniques has been used to promote spontaneous cephalic version. A midwifery technique claimed to be effective is to ask the mother to lie supine, hips slightly elevated and knees flexed, and to gently roll through 180 degrees from side to side for 10 minutes, repeating this three times a day. Traditional midwives in South Africa attempt to correct abnormal presentations during labour by manually shaking the uterus while the mother is in the knee-elbow position on the floor (Hofmeyer 1995). Elkins used chest-knee position to promote spontaneous version of the breech presenting fetus. The woman is instructed to kneel with hips flexed slightly more than 90 degrees but thighs not pressing against the abdomen, and head, shoulders, and upper chest flat on the mattress. This is done for 15 minutes every 2 hours of waking for 5 days (Chalmers et al . 1982) and it has been reported that approximately 90% of the babies underwent spontaneous version (Slade et al. 1998). Subsequently, three small randomised trials have been carried out to establish whether or not postural management is effective. Unfortunately, in these studies no significant benefits were found (Hofmeyer 1998) and there is therefore insufficient evidence to support routine recommendation of the knee chest position (RCOG 1993).

Breech presentation, irrespective of the mode of delivery, is a signal for potential fetal handicap and this should be kept in mind during antenatal, intrapartum and neonatal management. Danielian *et al.* (1996) reviewed the long term outcome (up to school age) of neonates presenting breech at delivery and found that there was a 19.4% overall morbidity, irrespective of mode of delivery. The range of handicap varied from severe, to problems such as speech delay, auditory and visual delay, and growth delay. The high perinatal mortality in breech presenting fetus has been associated with high incidence of low birth weight, prematurity, congenital malformations and fetal death before the onset of labour.

Vaginal breech delivery poses the fetus at risk to untoward intrapartum complications. Cord prolapse occurred in up to 7.4% of the women who had a trial of labour. The incidence of cord prolapse varied with the type of breech presentation, method of management of labour and parity. It was higher among non-frank breech presentations, ranging from 0 – 2% for extended breech, 5 – 10.5% for flexed breech, 8 – 16% for double footling breech and 10 – 29% for single footling breech. Cord prolapse was reported to be twice as frequent among multiparas (6%) as in nulliparas (3%), and was associated with a mortality rate of up to 40% (Cheng et al. 1993). Cord compression in vaginal breech delivery is more common due to the close proximity of abdomen and pelvic cavity; resulting in significantly lower Apgar Score following breech delivery as compare to vertex delivery. Nuchal or extended arms occurred in 5% of vaginal deliveries and was associated with a mortality rate of up to 22% and severe neonatal trauma in 25% of cases. The risk of entrapment of the unmoulded fetal head or difficulty

with delivery of the after-coming head was 0 – 8% across the 24 different studies reviewed by Cheng and Hannah (1993). Therefore, even when congenital malformations and intrauterine deaths are excluded, the perinatal mortality after vaginal breech delivery is three to four times higher than that associated with vertex delivery (Rovinsky et al. 1994) with a 12 fold increase in traumatic morbidity (Hellstrom et al . 1990).

The above data has led to suggestion that caesarean birth should be employed more often in an effort to reduce neonatal damage at term with breech presentation. Breech presentation as a primary indication for caesarean section has been advocated by several investigator and has become accepted by many clinicians as a modus operandi. The caesarean delivery rate for term breech presentation has continued to grow, in USA it has increased sevenfold, from 11.6% in 1970 to 79.1% in 1985, and approaches 100% at some institutions (Cheng et al. 1993). Although abdominal delivery may reduce fetal risks inherent in a vaginal breech delivery, it increases maternal morbidity and create potential hazard in subsequent pregnancies. The most ardent advocates of routine caesarean section for breech presentation acknowledge that the overall maternal risk from a relatively large number of additional caesarean section must be contrasted with the relatively few neonates who benefit from operative delivery. Green et al. (1982) in his study showed that the increase in caesarean rate for term breech has not reduced unfavourable outcome significantly, although a trend toward decreased trauma and death may exist. In the United States, there is a widespread belief that the overall cesaerean delivery rate is higher than necessary. Efforts are being directed toward decreasing the number of these procedures, in part by encouraging physicians to make changes in their

management practices. An important adjunct to the management of term breech presentation has been the successful and safe application of external cephalic version (Laros et al. 1995). Although the liberal use of vaginal delivery for term breech pregnancies has been suggested as one way of lowering the Caesarean section rate, the same group of researchers have found that the routine use of ECV will result in fewer caesarean sections compared with routine attempt at vaginal breech delivery, unless more than 79% of breeches are eligible for a trial of labour; a figure which is very unlikely to be achieved in most units (Lau et al. 1997). Therefore, ECV provides an attractive alternative to this longstanding and controversial obstetric dilemma. Furthermore with the publication of the article for the Term Breech Trial Collaborative Group in the *Lancet* (Hannah, 2000), the study recommendeds that for the term fetus in the breech presentation a planned caesarean section rather than a planned vaginal birth is better. It is therefore possible that external cephalic version is set to play an even greater role in future to prevent elective caesarean section in these women.

HISTORY OF EXTERNAL CEPHALIC VERSION.

External Cephalic Version (ECV) is a transabdominal manipulation involves the lifting of the fetal breech from the maternal pelvis and gently manoeuvring the fetus through 180 degree in its long axis by a forwards or backwards roll. The goal of ECV is to increase the propotion of vertex presentations among fetuses that were formerly in the breech presentation near term. This has been practiced for centuries from the time of Hippocrates and has been an acceptable technique, practiced in wide variety of cultures

and societies. Aristotles stated that many author of his time advised midwives when confronted with a breech presentation "to change the figure and place the head so that it may present at birth." (Savona-Ventura, 1986). The art of ECV has most recently been described by Myerscough (1998). However, ECV eventually fall out of favour as a result of several concerns: its high rate of spontaneous reversion if performed before 36 weeks, possible fetal complications, and the assumption that an external version converts only fetuses to vertex that would have converted spontaneously anyway. The current practice now is to perform ECV at term, avoiding complication such as iatrogenic prematurity and its problems. To address the assumption that in whom ECV was successful, were those who would have undergone spontaneous version regardless, Burr and Johanson (1996) reviewed three randomized controlled studies of ECV at term. They found that the rate of spontaneous version in the control group was 14 – 22%. In these three trials there was a virtually constant ratio of 3:1 ECV success rate to spontaneous version rate. While fetal complications have been related to external cephalic version, these might be avoidable by careful observation of the fetal heart rate patterns (Phelan et al. 1984). The rebirth of the use of ECV occurred in the early 1980s in the US, after a protocol developed in Berlin was replicated with favourable result. Consumer demands for more noninterventional birth experiences also played a role in its resurgence.

ECV receives increasing attention in an attempt to reduce the overall perinatal mortality and morbidity associated with term breeches. Controlled trials have shown that ECV at term can significantly decrease the incidence of breech delivery and caesarean section for breech delivery.

COMPLICATIONS OF EXTERNAL CEPHALIC VERSION.

ECV is not entirely free from hazard to both mother and fetus, though serious complications are rare. Fetal complications were defined as those leading to emergency intervention, delivery, induction of labour, discontinuation of the version attempt, and fetal death. Transient fetal heart rate changes were not included as a complication. Maternal complications were defined as severe pain requiring cessation of version attempt, version-related vaginal bleeding, abruptio placentae, premature rupture of membranes, and onset of labour (Zhang et al. 1993) and also untoward response to anaesthetic drugs or tocolytic agents used.

The use of anaesthesia for any elective procedure carries the risk of maternal mortality and morbidity. Furthermore the aggressive fetal manipulation made possible by anaesthesia was thought to increase the risks to both mother and fetus. Hofmeyer reported a 1% incidence of fetal death among women undergoing ECV attempts under general anaesthesia, and was 0.9% when neither sedation nor general anaesthesia was used (Lau et al. 1995). Epidural block provide excellent analgesia with pelvic and abdominal wall relaxation resulting in complete patient cooperation and improved success rate. Epidural analgesia is not only significantly increased the success rate, it carries no apparent ill effect on perinatal morbidity or mortality (Carlan et al. 1994). There is no difference in the incidence of abruptio placenta, fetal bradycardia, low Apgar scores, and low umbilical artery pH between the use of epidural analgesia and patients

without epidural analgesia. It also offers an added advantage that it can be rapidly extended if intervention is required. However, one consideration that is becoming more important is costs; the epidural anaesthetic service is definitely expensive.

There are few types of tocolytics reported to be used for ECV; Terbutaline, Magnesium Sulphate, Hexaprenaline, Ritrodine and inhalation anaesthetic agent (Marquette et al. 1996). Their used appears to carry no adverse effects on the mother unless contraindications to the use of these drugs are present. Assessment of the patients prior to the use of tocolysis and monitoring of the maternal blood pressure and heart rate during the procedure are important to detect any side effect of the drugs used and prevent seriour adverse outcome.

Fetal heart rate and movement patterns are subject to spontaneous changes from time to time, primarily associated with changes in fetal sleep state. Therefore changes observed after an event in an individual patient cannot be presumed to result from that event. Hofmeyer et al. (1983) found there was a significant decrease in fetal movements and fetal heart rate (FHR) variability and reactivity after external cephalic version; temporary baseline bradycardia; transient tachycardia and transient decelerations. The most likely explanation for the changes observed is that they represent the fetal response to a period of stress caused by decreased uteroplacental blood flow on the basis of increased intrauterine pressure during the procedure. This presssure, though probably less than the pressure generated by uterine contraction, was unphysiological in that it was maintained for longer periods of time than normal contractions. This possibility is supported by the

fact that the bradycardia is less than 5 minutes when the duration of the last manipulation was less than 3 minutes. Accordingly, duration as well as force of manipulation should be limited. The fetal heart should be continuously or frequently monitored. In an event of bradycardia, manipulation should be discontinued until a normal pattern returns. Between ECV attempts, time should be allowed for fetal recovery. The CTG changes described should be recognized as consequences of ECV, and monitoring after ECV continued until fetal well-being is confirmed. Phelan et al. (1984) reviewed fetal heart rate characteristics related to external cephalic version and tocolysis; and he found the changes were primarily bradycardias with/without decelerations and diminished fetal heart rate variability (< 5 bpm). All of these fetal heart rate changes were transient and bore no appparent relationship to the subsequent outcome of the fetus and was found to be unrelated to the tocolytic agent used.

The presence of 5 or more fetal cells per 150 000 maternal cells in the venous blood samples (0.25ml), indicates a significant fetomaternal harmorrhage (FMH). Using the Kleihauer test, Marcus et al. (1975) estimated that 6% of the patients after ECV showed evidence of fetomaternal bleeding of more than 0.2 ml and Gjode et al. (1980) found that FMH of 0.1 to 1.5 ml, which was sufficient to immunize rhesus negative mothers, occurred in 28% of 50 attempted ECVs. Marcus suggest that ECV should be approached with caution in rhesus negative patients who have no rhesus antibodies or who have mild rhesus-isoimmunization and need only few rhesus positive cells to evoke a marked secondary immune response. On the contrary, Lau et al. (1995) found the incidence of fetomaternal haemorrhage after external cephalic version was low, 1.8%, and the

complication was not found to be associated with difficult or unsuccessful version, or with any adverse perinatal outcome. Routine anti-D immunoglobulin should be given following version attempt. Routine assessment of fetomaternal haemorrhage after external version by Kleihauer test is not necessary, except in rhesus negative women with rhesus positive husband (where rhesus immunoprophylaxis is required), where only 500 IU (equivalent to 100 ug) of anti-D immunoglobulin used as the routine dose since a further dose of anti-D would be necessary in about 2% of patients (Lau et al. 1995).

The complications from external cephalic version must be considered in the light of complications following persistent breech presentation. Provided rigid screening for contraindications together with ultrasound imaging and external cardiotocographic control, the hazards attending version and the inevitable maternal morbidity associated with caearean section would be avoided. The maternal and fetal mortality and morbidity following version in late pregnancy appears to be negligible.

CONTRAINDICATION FOR EXTERNAL CEPHALIC VERSION.

Contraindications for external cephalic version are based on common sense approach. These include multiple pregnancy; when caesarean section is necessary irrespectives of presentation such as previous multiple cesaerean sections, placenta previa, cephalopelvic disporportion; compromised fetus for example intrauterine growth restriction, small for gestational age, fetal abnormality, unsatisfactory non stress CTG and abnormal biophysical profile, medical illness such as heart disease, uncontrolled thyroid disease,

pregnancy complicated with moderate to severe pregnancy induced hypertension, uncontrolled gestational diabetes, history of antepartum haemorrhage at present pregnancy, known case of uterine abnormality, premature fetus and most importantly patients who declined to give consent.

There are scanty information regarding external cephalic version in a woman who have preexisting uterine scar. In a review article, it was concluded that external cephalic version is absolutely contraindicated in patients with previous uterine scars (Savona-Ventura 1986). There is little objective evidence to support this conclusion. The obvious concern is that the manipulation of the fetus through the anterior wall of the uterus during attempted version may disrupt the integrity of the uterine scar, causing dehiscence or even frank uterine rupture. There are two small studies on ECV after previous caesarean section involving 11 samples (Schachter et al. 1994) and 56 samples (Flamm et al. 1991). The successful version rates were 100% in the former and 82% in the latter. Both of the studies concluded that the likelihood of successful external cephalic version is not lowered by the presence of a prior uterine scar. In both studies, the integrity of the scar were routinely checked, patients that eventually delivered vaginally had a postpartum manual exploration of the uterine cavity to assess possible dehiscence of scar and those who delivered by re-caesarean had the uterine scar carefully examined for signs of dehiscence before the uterus was re-opened. There were no serious maternal or fetal complications associated with the version attempts. However, because of the limited sample size, these studies do not prove that the scarred uterus is not at increased risk of rupture during attempts at external cephalic version. The overall risk of scar rupture in

patients with pre-existing uterine scar undergoing trial of labour is small, 0.5%, therefore in order to prove the safety of ECV in patients with scarred uterus, there need to be a very large number of patients. For the purpose of this study, generally patients with one previous scar would be excluded from the study bearing in mind that it is not an absolute contraindication.

External cephalic version during labour is worthy of consideration as an extension of the trend towards version later in pregnancy (Hofmeyer 1983). Women were considered in labour if they had painful regular uterine contraction every 3 minutes or more before the procedure (Lau et al. 1997). In theory, this approach has several advantages. Maximum time would be allowed for spontaneous version to take place and for possible contraindications to external cephalic version to appear, thus limiting the number of attempts of version that would be necessary. The risks of external cephalic version may be reduced further by performing the procedure in the labour ward, with continuous subsequent monitoring of the fetal condition until delivery. In cases assessed as unsuitable for vaginal breech birth, the external cephalic version may be attempted in the operating theatre, and in the event of failure followed immediately by caesarean section. Fergusson and Dyson (1985) reported a series of 15 attempted external cephalic versions during labour in women considered unsuitable for vaginal breech delivery and who had intact membranes. The presence of uterine irritability or active labour had no effect on the likelihood of success as long as the breech had not descend into the pelvis. Successful rate was 73% (11/15) and caesaerean section avoided in 10 (67% from overall) of these women. A further advantage is that in Rh negative women, anti-D

gammaglobulin can be administered after delivery, and the unnecessary use in the 40 per cent of these women who will have Rh negative babies can be avoided. Disadvantages of the approach would include the inconvenience of version as an emergency rather than as elective procedure, and the increase risk that the membranes may rupture spontaneously before external cephalic version can be attempted. Because the disadvantages mentioned, it is unlikely that external cephalic version during labour will become a first-line approach for breech presentation. However, when breech presentation is encountered during labour prior to rupture of the membranes, the limited data available to date suggest that external cephalic version with tocolysis is a reasonable procedure to consider. Attempts at external cephalic version after spontaneous rupture of the membranes were uniformly unsuccessful. For the purpose of this study patients who were in labour were generally not included due to several reasons; the inconvenience of the need to do the procedure as emergency after office hour, the technical difficulty if ECV is to be done when patients already having contraction and because not all doctors in the department are comfortable with the procedure.

An anterior placenta has been considered to be a relative contraindication to an external cephalic version by some authors (Hofmeyer 1983). However data from other studies do not support either increased or diminished success (Donald et al. 1990) therefore this study includes cases with anterior placenta.

FACTORS ASSOCIATED WITH SUCCESSFUL VERSION.

The ability to predict correctly the outcome of either a disease or a procedure is of paramount importance in all branches of medicine. It facilitates the balancing of the relative risks and benefits of available alternative treatments by the physician, and allows individualised counselling.

Various parameters have been reported in the medical literature to be predictive of the outcome of external cephalic version. These factors can be divided into four categories:

Clinical and historical	Parity
	Presence of uterine contraction
	In labour at the time of ECV
Ultrasonographic	Type of breech
	Location of placenta
	Position of fetal spine
	Amniotic Fuid Index
	Estimated Fetal Weight
Clinical examination	Engagement of fetal part
	Obesity of abdomen
	Uterine tone (relaxed/tense)
Procedure	Use of tocolytics
	Use of epidural analgesia

However, most of these reports were limited by small sample size, with conflicting results. Univariate analysis predominated in these reports, this does not exclude the possibility of confounding effects between the variables. Furthermore, many of the variables tested are clinical characteristics which might have been associated with significant inter-observer variation. From the various clinical and ultrasonographic features, eight of them were the most frequently quoted as statistically significant affecting the outcome of version. These are listed in table 1.1.

Table 1.1 Commonly Reported Factors Affecting the Outcome of External Cephalic Version

	No of ECV	Parity	BMI/ Obesity	Placental site	Type of breech	Position of fetal spine	AFI	Engagement/ station	EFW
Brocks et al. 1984	31	S	S	S	–	–	–	–	–
Donald et al. 1990	65	NS	–	NS	S	S	NS	NS	–
Ferguson et al. 1987	158	S	–	S	S	S	S	–	NS
Fortunato et al. 1988	67	NS	S	NS	NS	S	S	S	NS
Hellstrom et al. 1990	300	S	NS	NS	S	–	S	–	–
Hofmeyer et al. 1986	80	S	–	S	NS	–	NS	–	–
Morrison et al. 1986	304	–	–	S	–	–	–	–	–
Newman et al. 1993	108	S	NS	S	–	–	–	S	S
Shalev et al. 1993	55	NS	NS	NS	NS	NS	S	–	S

S = the factor was significantly associated with the outcome of ECV, either positively or negatively

NS = the factor was not found to be related to the outcome of ECV

(--) = the factor was not examined in that study

Tocolysis, combined with ultrasonography and/or fetal monitoring has been used in an effort to develop a safer and more successful ECV (Fortunato et al. 1988). A tense uterus limits the mobility of the baby and therefore decreases the chance of successful external cephalic version. Theoretically tocolysis assist the procedure by giving adequate uterine relaxation; defined as cessation of all uterine activity detectable by abdominal palpation and external monitoring, or softening of the uterus with the ability to easily palpate fetal parts through the abdominal wall. Two randomized studies showed that tocolysis is likely to improve the overall success rate of external cephalic version in late pregnancy compared with placebo, it is interesting to review this effect on groups of low and high rates of success (nulliparous and parous groups of patients). The effect is the result of a significant increase in success rates in nulliparous subjects. Parous women do not seem to benefit from the use of tocolysis for external cephalic version (Marquette et al.1996, Chung et al. 1996). Existing evidence may not support routine use of a tocolytic agent during ECV attempts in multiparous patients, but a tocolytic agent could improve success in nulliparous women (ACOG Practice Patterns 1997). The experience of the operator have a significant impact; tocolysis increases the chance of success where doctors are learning the technique (Chung et al. 1996), however as the physicians become proficient at the ECV technique, the advantage diminished. Of course, tocolysis, ultrasound, and fetal monitoring will not ensure a safe procedure. As Ranney (1973) stressed, external cephalic version is a "gentle art." No patient should be subjected to a traumatic and overly vigorous procedure in an attempt to obtain a "successful" external version at the expense of safety. In China, laser accupunture has been used to assist external cephalic version (Hofmeyer 1995).

Parity is the commonest reported predictor for successful external cephalic version. This is due to the more lax uterus in the multiparous women as compare to nulliparous and the engagement of presenting fetus is later in the former as compare to the latter. However this findings was not consistent; Van Dorsten et al.(1981) and Fergusson et al.(1987) found significantly improved success rates among parous women, whereas other investigators have found that nulliparity was associated with neither a lesser chance of success nor more difficult versions (Stine et al. 1985, Fortunato et al. 1988).

Neither Stine et al. nor Fortunato et al. could relate birthweight to the success or failure of the version attempt. Fergusson et al. found the likelihood of success could not be related to an estimated fetal weight of either greater or less than 3500 gram. However, they did find that successful version was unlikely when the fetal abdominal circumference was below the 5 percentile. Newman et al. (1993) found that increasing fetal weight was associated with greater success, presumably because of an improved ability to manipulate the fetus. On the contrary, Shalev et al.(1993) found that version was more likely to success if the fetal weight estimation was less than 3600 gram. These conflicting results may be because of the influence of other confounding variables. Estimation of fetal weight will be the most difficult variable to determine. However, with the increasing use of ultrasonography an acceptable margin of error should be achieved, especially considering the wide birth weight categories. Obviously, a patient who would not be a candidate for vaginal delivery because of gross macrosomia may need to be reconsidered as a version candidate.

The effect of placental location on the success of external cephalic version has probably been the most controversial. Brocks et al. (1984) has reported an increased failure rate with an anterior placental location, whereas both Hofmeyer (1983) and Fergusson et al. (1987) found higher failure rates with cornual implantations. Similarly, Newman et al. (1993) found that posterior, lateral, and fundal placentas were more frequently associated with success than were anterior placentas. In contrast, neither Fortunato et al. (1988), Morrison et al. (1986), or Donald et al. (1990) could find any relationship between placental location and procedure success. In this study cornual implantations would be considered as either fundal or lateral depending on the predominant location.

In the original paper by Van Dorsten et al. in 1981, they noted an improved success rate with an undilated cervix or a high presenting part. Many reviews have not included an assessment of the cervical status; however, Fortunato et al. did report in 1988 an increased failure rate with descent of the breech into the pelvis past the –3 station and Newman et al (1993) found no success in cases where descent of the breech into the pelvis reached a –1 station or lower.

The posterior position of the fetal spine was associated with an increased rate of failed version. Possible explanation is; with the fetal back located posteriorly, only the soft parts of the fetus are palpable. They are more difficult to use as points of leverage in turning the fetus. The posterior position of the spine may also make the umbilical cord more vulnerable to compression during the version attempt (Donald and Barton 1990).

Fetal acoustic stimulation has been used adjunctively to enhance antenatal testing by reducing biophysical profile and non stress testing time, evaluate fetal well being during the intrapartum period, and repositioning (fetal shifting) to enhance ultrasonographic imaging and fetal procedures such as external cephalic version. Johnson et al . (1995) studied the role of fetal acoustic stimulation to assist ECV. He found that fetal acoustic stimulation shifts fetal position from the fetal spine at maternal midline to fetal spine at maternal lateral and increases the chance of successful version. There have been no reported adverse outcome with the use of fetal acoustic stimulation. Arulkumaran et al. (1987) screened 465 children after in utero fetal acoustic stimulation and found no evidence of hearing loss at 4 years of age.

Maternal obesity was defined as 20% or more above standard weight for height, corrected for pregnancy (Fortunato et al. 1988). Maternal obesity was negatively associated with successful version (Mauldin et al. 1996, Fortunato et al. 1988). Obesity makes palpation of the fetus and ECV difficult, often requiring an increase in the amount of force necessary to accomplish version. The ease with which the fetal head could be palpated clinically was found to be one of the most significant factors in determining the outcome of external cephalic version. It should be easier to apply pressure to the baby if both poles of the baby are easily identified; any attempt to turn a baby would be less effective with pressure applied to one pole only. While the above association seem to be logical, Shalev et al (1993) and Newman et al (1993) showed that this was not true in all cases, their results found no association between maternal obesity and successful version.

Shalev et al. (1993) found that amniotic fluid volume is the most important criterion for a successful version. Obviously in a case in which oligohydramnios was present, a vigorous attempt to convert the fetus was not considered. In this study, ECV only being considered after exclusion of abnormal liquor volume, be it polyhydramnios or oligohydramnios.

Extension of the fetal legs, as such, the type of breech does not appear to influence the success rate of ECV (Savona-Ventura 1986, Mauldin et al. 1996, Stine et al. 1985 and Lau et al. 1997). However Donald and Barton (1990) found in their study that a nonfrank breech was associated with a relative failure rate of the external cephalic version. Even under tocolysis, with an incomplete breech the fetal leg might serve as a splint, decreasing the ability to turn the fetus. This seem logical as spontaneous version occur less common with extended fetal legs.

The results of ECV, like other procedure, are also considered to be influenced by the clinical skill of the practitioner and some authors advise that the procedure should only be performed by experienced obstetricians. However, Newman et al.(1993) found that operator experience did not affect version success. Van Dorsten et al. (1981) noted that in spite of the fact that no author had done more than two versions prior to undertaking their study, experience did not improve the success rate. Thus, the success rate in the second half of the study was not significantly better than that in the first half of the study. They suggest that under tocolysis experience may not play as important a role as has been previously suggested.

The great controversy in the literature regarding prognostic factors suggests that no one variable will optimally predict procedure success. Attempts have been made to create a scoring system to predict the outcome of ECV, a system similar to that of Bishop; but these have not been validated by multiple studies (ACOG Practice Patterns 1997). In fact, when the individual components of the external cephalic version scoring system and other clinical factors not included in the scoring system were evaluated in the 266 breech presentations tested prospectively, no single factor really stood out other than deep descent of the breech into the pelvis and maternal parity of two or more (Newman et al. 1993).

THE SUCCESS RATE OF ECV.

Between 1981 to 1993, there were twenty-five published studies on ECV from which thirteen were conducted in the United States, six in Europe, four in Africa, and two in other areas. The sample size varied from as few as 10 subjects to 304 patients. The overall success rate of external version ranged from 41% to 97%. There were different success rate from different regions. In the United States the overall success rate was 64.5%, in the Europe it was 10% lower; which was 55.8% and the highest was in Africa (Zhang et al. 1993). In Africa this figure was nearer 90%, probably due to the increased angle of inclination of the pelvic inlet (Coltart et al .1997) therefore engagement of the presenting part occur later as compared to other race. A review of the literature involving

741 patients in North America and Europe indicates that a success rate of 62% after 37 weeks should be attainable (Zhang et al. 1993).

It is interesting to note that the above results, despite the availability of ultrasonography and tocolysis, is not much different from that reported by both Williams and Edgar at the turn of the century (Hanss 1990).

The rates of vertex presentation at delivery were similar to the success rates, indicating that there were few spontaneous cephalic versions after failure of external cephalic version attempts, or reversions after successful attempts (Zhang et al. 1993). Stine et al. (1985) noted that ninety-three percent of all successfully turned fetus remained vertex. Burr and Johanson (1999) reported that the rate of spontaneous reversion to breech presentation after one or more attempts at ECV ranged from 0% to 3%.

While not reducing significantly the fetal mortality, successful version has a definite influence in reducing the high fetal morbidity associated with vaginal breech delivery. In centres where caesarean section is freely undertaken to reduce the fetal mortality and morbidity following breech delivery, ECV by reducing the incidence of breech presentations reduces the caesarean section rate with the attendant benefits to the mother.

DELIVERY OUTCOME FOLLOWING EXTERNAL CEPHALIC VERSION.

The use of ECV at term has been proven to be both safe and successful in reducing the incidence of breech presentation at delivery (Zhang et al. 1993). Hofmeyer (1998) identified six randomised trials comparing ECV with expectant management at term. The pooled data showed ECV to be associated with a significant reduction in non-cephalic births (relative risk 0.42, 95% confidence interval 0.35 – 0.5) and caesarean section (relative risk 0.52, 95% CI 0.39 – 0.71). Successful version increases the chance of vaginal delivery, hence avoiding caeasarean section with inherent risk to the mother and avoiding vaginal breech delivery with significant risk to the fetus.

However, the incidence of intrapartum caesarean section following a successful version has been unexpectedly high; repeatedly reported to be around 20% to 30%, although there were three studies reported the incidence to be less than 10%. Table 4.2 list out the caesarean section rate following successful version from various reports. This figure might appear to be close to the background of caesarean section in most institutions. However, virtually all studies have excluded cases that are high risk for caesarean section, such as those with a scarred uterus, preterm pregnancies, or growh restriction. Therefore an incidence of 20% - 30% of abdominal delivery among this highly selected group of patients was exceptionally high. This is supported by one of the largest studies from Laros et al. (1995) in which the caesarean section rate was 30% in patients after successful external cephalic version compared with 15% in all term singleton