Obstructed labour is an important cause of maternal deaths in communities in which undernutrition in childhood is common resulting in small pelves in women, and in which there is no easy access to functioning health facilities with the capability of carrying out operative deliveries. Obstructed labour also causes significant maternal morbidity in the short term (notably infection) and long term (notably obstetric fistulas). Fetal death from asphyxia is also common. There are differences in the behaviour of the uterus during obstructed labour, depending on whether the woman has delivered previously. The pattern in primigravid women (typically diminishing contractility with risk of infection and fistula) may result from tissue acidosis, whereas in parous women, contractility may be maintained with the risk of uterine rupture. Ultimately, tackling the problem of obstructed labour will require universal adequate nutritional intake from childhood and the ability to access adequately equipped and staffed clinical facilities when problems arise in labour. These seem still rather distant aspirations. In the meantime, strategies should be implemented to encourage early recognition of prolonged labour and appropriate clinical responses. The sequelae of obstructed labour can be an enormous source of human misery and the prevention of obstetric fistulas, and skilled treatment if they do occur, are important priorities in regions where obstructed labour is still common.

Introduction

Each year, 210 million women become pregnant, of whom 20 million will experience pregnancy-related illness and 500,000 will die as a result of the complications of pregnancy or childbirth. In 1987, the World Health Organization (WHO) launched the Safe Motherhood Initiative, which aimed to reduce maternal morbidity and mortality by 50% by the year 2000. The initiative did not succeed but maternal health continues to be a major focus of WHO effort. The current WHO initiative is to reduce maternal mortality to 75% of the 1990 level by 2015. If this is to be successful, the problem of obstructed labour will need to be addressed effectively.
Obstructed labour remains an important cause of not only maternal death but also short- and long-term disability. It has particular impact in communities in which mechanical problems during labour are common and availability of functioning relevant health services is sparse. Obstructed labour comprises one of the five major causes of maternal mortality and morbidity in developing countries\(^3,4\). The number of maternal deaths as a result of obstructed labour and/or rupture of the uterus varies between 4% and 70% of all maternal deaths, amounting to a maternal mortality rate as high as 410/100,000 live births\(^5\). The literature suggests that in many countries, maternal mortality due to this cause is almost as prevalent today as it was 30 years ago.

Maternal mortality from obstructed labour is largely the result of ruptured uterus or puerperal infection, whereas perinatal mortality is mainly due to asphyxia. Significant maternal morbidity is associated with prolonged labour, since both post-partum haemorrhage and infection are more common in women with long labours. Obstetric fistulas are long-term problems. Traumatic delivery affects both mother and child.

In this paper, we will describe important epidemiological associations of obstructed labour, its definition, recognition and management, and chart the serious sequelae that may follow—especially if clinical intervention is tardy or inappropriate or, as is commonly the case in much of the world, simply unavailable. We will also speculate on why there are differences in the behaviour of the uterus in women who have obstructed labour and who have, or have not, had babies previously—based on emerging but incomplete understandings of the cellular physiology and pathophysiology of uterine contractility.

**Definitions**

The term ‘obstructed labour’ indicates a failure to progress due to mechanical problems—a mismatch between fetal size, or more accurately, the size of the presenting part of the fetus, and the mother’s pelvis, although some malpresentations, notably a brow presentation or a shoulder presentation (the latter in association with a transverse lie) will also cause obstruction. Pathological enlargement of the fetal head, as in hydrocephalus, may also (though rarely) obstruct labour. Difficult labour may also be associated with an occipito-posterior position of the fetal head and with ineffective uterine contractions (the latter often described as ‘dysfunctional labour’). These different causes of dystocia (difficult labour) may co-exist.
Epidemiology

There is a substantial literature, reviewed elsewhere, to show an association between cephalo-pelvic disproportion, as a cause of obstructed labour, and maternal height—which is linked to pelvic size. Maternal height reflects the nutritional status of individuals from childhood. There may be large deviations from normal if there had been rickets in childhood or osteomalacia in adolescence. Pregnancy in adolescence may pose problems even without gross nutritional deficiencies because the bony pelvis may not yet have achieved its full dimensions. Different cut-off heights have been identified in different communities to highlight an increased risk of obstetric labour, the individual values reflecting genetic diversity.

Consequences

The risk of maternal death from obstructed labour is greatest in developing countries with poorly resourced health services. Most reports come from tertiary referral, specialist hospitals and the findings of case series in these institutions may not reflect the reality in the community. However, a community-based retrospective survey of maternal deaths in a region of Uganda, using the sisterhood method, found 26% of 324 deaths to be attributable to obstructed labour; this cause was second only to haemorrhage. A similar proportion (19% of 350 deaths) was identified in a prospective study, using verbal autopsies, in Guinea-Bissau.

In communities with poor access to obstetric care, obstructed labour leads to maternal dehydration, infection, ketosis and exhaustion. The major immediate causes of death in obstructed labour are sepsis, and haemorrhage from uterine rupture. Sepsis is more common in primigravid women, and uterine rupture in parous women. It is commonly observed that obstruction in the primigravid woman is associated with a gradual decrease in the strength and frequency of contractions, whilst obstruction in the parous woman does not seem to decrease contractility so that the lower segment continues to thin until rupture occurs. We speculate on the possible reasons for this later. Sepsis results from the prolonged state of an open cervix often with ruptured membranes impairing natural, mechanical barriers to ascending infection from the vagina.

Obstructed labour is the leading cause of uterine rupture worldwide. It is very rare in primigravid labours. A recent 7 year review carried out in Ghana found that rupture was due to prolonged labour in around one-third of all cases. Similar figures have been reported from other regions (e.g. in Delhi 27% of ruptures in a 5 year period were due to obstructed...
labour\textsuperscript{10}). Uterine rupture is life threatening because of the haemorrhage, and is often treated by total abdominal hysterectomy. The perinatal mortality rate in the above studies was around 75\% and maternal deaths in these teaching hospitals were 1 and 3\%. Higher values will occur in less well resourced areas; a study, for example, examining obstetrical causes of maternal morbidity in six West African countries, reported obstructed labour as being, like the Uganda study, second only to haemorrhage as a cause of maternal morbidity with a fatality rate of 30\% attributed to poor obstetrical care\textsuperscript{11}.

Women who have undergone caesarean section previously for obstructed labour are particularly at risk of uterine rupture in subsequent labours, especially if stimulated by uterotonic drugs, or if remote from clinical facilities.

Fistula formation is more common in the primigravid woman. In a large case series from the famous fistula hospital in Addis Abada, 97\% of vesico-vaginal fistulas occurred after obstructed labour; 65\% of women were aged less than 25; and 63\% had been primigravid\textsuperscript{12}. Vesico-vaginal fistulas mainly result from the ischaemic necrosis of vaginal and bladder tissues, trapped between the fetal head and the mother’s pubic symphysis during prolonged, obstructed labour. Recto-vaginal fistulas may also form but these are less common, presumably because of the absence of a maternal bony surface in close proximity, posteriorly. Uncontrollable passage of urine, and sometimes faeces, through the vagina assures a wretched existence\textsuperscript{13}. There is, in addition, damage to a wider field of pelvic tissue than that which necroses and sloughs to form the fistula, resulting potentially in urethral and cervical destruction, stress incontinence, vaginal stenosis, amenorrhoea, osteitis pubis and foot-drop\textsuperscript{14}.

**Physiology of uterine contractions**

Consideration of the different types of adverse outcome in primigravid and parous women in obstructed labour requires review of what is known about the physiology of uterine contractility.

Once initiated, labour consists of a series of uterine contractions. Typically these will last for 60 s and reach pressures of 50 mmHg. This represents a significant metabolic demand upon the mother. Our knowledge of the mechanisms underlying the contractions has increased considerably in the last decade. There is a pattern of electrical changes, depolarization, across the membrane of the smooth muscle cells in the uterus, which opens channels permeable to calcium. On entering the myometrial cell, the calcium binds to calmodulin and activates the enzyme myosin light chain kinase (MLCK). Activated MLCK phosphorylates myosin, thereby stimulating interaction with actin and subsequent cross-bridge
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Cycling and contraction. The cross-bridge cycle consumes ATP and ATP hydrolysis produces acidification. This basic cycle of:

\[ \text{depolarization} \rightarrow \uparrow \text{Ca}^{2+} \rightarrow \text{active MLCK} \rightarrow \text{contraction} \]

can be modified by agents occurring naturally or administered clinically, such as oxytocin and prostaglandins. For example oxytocin can augment the rise in calcium, decrease the rate of calcium efflux from the cell and decrease the rate at which myosin is dephosphorylated (and inactivated). All these effects will promote stronger and longer contractions.

Physiologically, the uterus has been prepared for labour by altering the expression and control of those proteins needed for contraction. In particular, the balance of the ion channels shifts, so that potassium channels, which are associated with hyperpolarization, are less influential on the membrane potential. This in turn will increase the chance of the calcium channels opening and increase the contractile drive on the uterus. Biochemically, the myometrium has also been preparing for labour by increasing its glycogen store and fatty acid droplets. There is also a small increase in phosphocreatine, from which ATP can be re-formed from ADP. Lactate dehydrogenase also increases its activity, so that more pyruvate will be formed into lactic acid, rather than entering the Kreb’s cycle for oxidative metabolism. These changes can be summarized as a preparation for periods of anaerobic metabolism. This is exactly what happens in labour, as the powerful contractions compress uterine blood vessels, causing transient hypoxic episodes. The myometrium responds by producing ATP anaerobically, i.e. via lactic acid, and utilizing its reserves.

There appear to be fundamental differences between the behaviour of the uterus of the primigravid women and the parous women in obstructed labour. Rupture, rather than fistula, appears as a more common consequence in parous women. We can find no clear descriptions of uterine activity during obstructed labours. It appears that in primigravid women, if a mechanical obstruction to labour exists, the uterine contractions gradually weaken and then stop. However, in multiparous women, contractions continue until delivery or uterine rupture occurs.

Pathophysiology of uterine contractions in obstructed labour

The obvious purpose of labour is to deliver the fetus and then placenta, whether the labour becomes obstructed or not. Thus, the initial pattern of uterine activity will be the same in the two cases. The uterus will expend energy producing cycles of contraction and relaxation. The metabolic cost of this can be met in a healthy mother and activity sustained for many hours. However, if the hours become days then the situation
will change. Leaving aside for the moment the emotional distress and physical exhaustion of the mother, along with the restricted intake of food and drink, what will be happening to the uterus? It will gradually be depleting its metabolic reserves, i.e. glycogen, and finding difficulty in maintaining ATP levels. There may also be an acidification due to the continued production of lactic acid coupled with a decreased ability to extrude protons, as this is energetically demanding and ultimately relies on ATP. We know from work on animal and human uteri that acidification decreases the ability of the uterus to contract. Therefore it is not difficult to predict that uterine contractions will start to weaken in prolonged labours, due to physiological and biochemical reasons.

Therefore, we can propose a hypothesis for diminished uterine contractility in obstructed labour in primigravid women. The uterus probably stops contracting because of myometrial acidification. This acidification results from local myometrial energy depletion, anaerobic metabolism, and systemic ketosis. In parous women, perhaps the myometrium becomes tolerant to the effects of acidification by an unknown mechanism and does not stop contracting. Continued contractions in the presence of myometrial energy depletion and hypoxia are likely to lead to myometrial oedema and necrosis contributing to uterine rupture.

In addition to optimizing the clinical care of women with obstructed labour, there is an urgent need for high quality research to link clinical observations and intervention studies to the laboratory sciences. The questions remaining to be addressed if the WHO objectives are to be achieved are: an accurate definition of obstructed labour, verification of the pathophysiology of obstructed labour and the prevention of consequences arising from obstructed labour.

Recognition and prevention of prolonged labour

Improved outcome after obstructed labour requires early detection of abnormal progress of labour, and appropriate clinical responses in accessible, equipped and staffed units. Before the problems of preventing and managing prolonged labour can be addressed, it is first important to highlight the difficulties of defining exactly what constitutes an abnormal labour.

Confirmation of progress in labour is determined by the identification of increasing cervical dilatation and cervical effacement. Normal labour has been defined as when a baby is born within a period of 12 h, via the natural passages, through the efforts of the mother, and when no harm befalls either party as a result of the experience. Yet, a more useful definition is the rate of progress of cervical dilatation (usually expressed in
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centimetres per hour)\(^{16}\). Correction of prolonged labour is therefore dependent on regular cervical assessment. However, this measure, although generally accepted, may not be precise and there are no reported trials of either inter-observer or intra-observer reproducibility.

Midwives and obstetricians can all agree that a major degree of cephalo-pelvic disproportion should be classified as abnormal\(^{17}\). However, there is little consensus concerning the labouring primigravida who has made slow but steady progress for, say, 20 h in the absence of maternal or fetal distress. The definition of normality is vague, with a resulting variation in hospital guidelines. Many studies have described the duration and velocity of labour in various groups of women ranging from a normal duration of labour for a primigravida being 5.6 h\(^{18}\) to suggestions that 13.3 h is more appropriate\(^{19}\). Yet these data lack clinical relevance, as direct comparisons are difficult owing to variations in study eligibility criteria. A more recent definition of prolonged labour provided by WHO for primiparous women was more than 18 h\(^{5}\). In contrast, in the National Maternity Hospital in Dublin, the definition of a prolonged labour has been steadily and systematically reduced from 48 to 12 h\(^{20}\).

In the struggle to balance early diagnosis and correction of prolonged labour with the use of unnecessary intervention, no consensus has yet been reached amongst midwives and obstetricians to provide a definition of normality.

**History of the partogram**

The development of the partograph (or partogram) provided health professionals with a pictorial overview of the labour to allow early identification and diagnosis of the pathological labour.

The first obstetrician to provide a realistic tool for the study of individual labours was Emanuel Friedman\(^{21}\). In his study of 100 primigravidae at term, cervical dilatation was determined by frequent rectal examinations. For reproducibility, the examination was carried out at the peak of the contraction and for uniformity, measurements were recorded in centimetres. A simple, but effective chart was devised whereby square graph paper was used, with 10 divisions representing the cervical dilatation. The measurements were recorded and joined to the previous measurement in a straight line. The slope of each line was determined in terms of centimetres of dilatation per hour. The curves obtained by this simple technique were similar in shape and resembled a sigmoid curve. Friedman’s explanation divided the first stage of labour into two parts: firstly, the latent phase which extends over 8–10 h and up to 3 cm dilatation; secondly, the active phase, characterized by acceleration from 3 to 10 cm, at the end of which is a decelerative phase. The major criticism of the development
of this curve was the fact that no exclusions were made for malpresentations, malpositions or multiple pregnancies. Similarly, women receiving oxytocin infusions, caudal analgesia and/or operative delivery were included. However, although the Friedman’s labour curve is a crude version of the one used by many midwives and obstetricians today, it did recognize the fact that labour is sensitive to interference, prolonged with heavy sedation and shortened with stimulation. These have remained important factors when managing labouring women.

A randomized study of 434 women in Mexico\(^2\) reinforces the benefits of the Friedman partogram. In this study, women were randomized to either a Friedman partogram or a non-graphical descriptive chart. The results showed that there were more operative deliveries in the descriptive group and more babies with low Apgar scores at 5 min. The conclusions drawn from this study were that the Friedman partogram not only has diagnostic and prognostic value but that it also benefits the management of women in labour.

Philpott’s partograph developed from the original cervicograph of Friedman, providing a practical tool for recording intrapartum details\(^2\). This was in an attempt to rationalize the use of maternity services in Harare (then Salisbury) in Zimbabwe (then Rhodesia). This structure has been replicated elsewhere in the developing world and comprised a hospital with medical staff and operating theatre facilities, and 13 peripheral clinics staffed mainly by midwives. Approximately half of the 40,000 deliveries took place in the hospital and it was imperative to ensure that only high risk women delivered there.

To advance Friedman’s partograph, an alert line was placed on the cervicograph. This innovation was introduced following the results of a prospective study of 624 consecutive women\(^2\). Unlike Friedman, Philpott and Castle had a more focused eligibility criteria for their study. Women were only included in the study if the cervix was already 3 cm dilated on admission.

The alert line, unlike that of Friedman’s, was straight, not curved. The line was a modification of the mean rate of cervical dilatation of the slowest 10% of primigravid women in the active phase of labour and progressed at a rate of 1 cm per hour. Should a woman’s cervical dilatation progress slowly and cross the ‘transfer line’, 2 h to the right of the alert line, then arrangements were made to transfer her from a peripheral unit to the central unit where prolonged labour could be managed more effectively.

The next stage in the development of the partogram by Philpott and Castle was the introduction of an action line drawn 4 h to the right of the alert line\(^2\). This line was developed on the premise that correction of primary inefficient uterine action would lead to a vaginal delivery. To evaluate the action line, a prospective study was carried out which concluded that
the action line allowed 50% of patients whose cervicograph crossed the alert line to avoid being given oxytocin stimulation. It also showed a lowered incidence of prolonged labour and a reduction in caesarean sections. However, the reliability of this study can be questioned as although it is a ‘prospective clinical study of 624 patients’, many of the findings are based on a comparison of women who delivered in the department in 1966. Furthermore, the actual number of women who crossed the action line was only 68; chance findings can therefore not be completely excluded.

What is surprising perhaps is that the use of the partogram itself was only rigorously evaluated 20 years after its introduction. The WHO partogram is an adaptation of the one formulated and described by Philpott and colleagues. To test whether the use of the WHO partograph improves labour management and reduces maternal and fetal morbidity and mortality, a prospective study of 35,484 women was carried out. The study lasted 15 months and involved four pairs of tertiary level hospitals in South East Asia. During the first 5 months all the hospitals collected data about delivery. For the next 5 months the WHO partograph was introduced into one of each hospital pair. For the last 5 months, the partograph was introduced into the remaining four hospitals. The protocol for management of labour included no intervention in the latent phase until after 8 h, amniotomy in the active phase, augmentation, caesarean section or observation to be considered if the action line is reached. The introduction of this package was accompanied by ‘several days’ of intensive teaching of the midwifery and the medical staff. The outcomes that showed significant improvement were: fewer prolonged labours (>18 h), fewer augmented labours and less post-partum sepsis.

In order to avoid the pitfalls of a historical control design, hospitals were randomly allocated to implement the partograph in phases. However, this method also had its pitfalls. The authors state that it was not possible to randomize the individual to either conventional or to partograph care. There is only one reliable way of testing whether an intervention improves outcome and that is with a randomized controlled trial. The research method used in that study had several ways in which the results could have been biased and lays the results open to doubt.

To test whether the partograph was the cause of change in outcome between the hospitals studied, the introduction of the partogram should have been the only variable which was changed. In this study, the introduction of the partogram was accompanied by several days intensive teaching of midwifery and medical staff with the help of a WHO consultant in each centre. It was also introduced with a protocol, which specified, among other things, that the women’s membranes were ruptured in the active phase of labour. Either, or both of these latter changes could have led to the change in outcomes, e.g. fewer augmented labours.
Even if the results could be relied upon, one could question how applicable they are in other settings, i.e. other than in tertiary level hospitals in South East Asia. The authors stated that the WHO trial has shown beyond doubt that the partograph should be used on all women in labour. Yet the effect of the partograph in, for example, a health centre with no facilities for caesarean section and inadequate supplies or a hospital where highly trained midwives give care is uncertain. Thus, the results of this study do not offer adequate support to allow the partograph to be recommended for use for all women.

The WHO press release claims that the use of the partograph reduces the caesarean section rate—in fact, the paper shows that this was not a significant result. Only reductions in prolonged labour, augmented labours and post-partum sepsis reached statistical significance. The authors report that the proportion of labours requiring oxytocic augmentation was reduced by 54%—from 20.7 to 9.1%. It is difficult to come to any conclusion except that the previous rate of augmentation was unnecessarily high. This interpretation is supported by the authors’ observation that the improvements were ‘most marked in normal women’. In which case, the partograph is simply correcting a poor standard of care, rather than making childbirth safer per se.

It must be understood that the majority of trials of partography have taken place in hospital settings where most maternal deaths occur among women admitted with severe complications and often neglected labour. No trial to date (even the WHO trial) has demonstrated that the partograph does reduce maternal mortality.

The partogram as a whole needs to be evaluated further, as do its individual components. There is a need to clarify the association of abnormal patterns with underlying causes. The classical pattern attributed to cephalo-pelvic disproportion is secondary arrest of cervical dilatation, with a normal initial dilatation rate of cervical dilatation followed by cessation of dilatation. However, the situation can undoubtedly be more complex with, for example, relative disproportion being exacerbated by occipito-posterior positions, or secondary failure of uterine contractility occurring with prolonged labour (as described previously). The importance of the observation of degrees of moulding of the fetal head also merits further study.

**Management of prolonged labour**

It is ironic that in many parts of the western world, there are concerns about caesarean section rates steadily rising without evidence of a reduction in perinatal mortality and morbidity. In contrast, in many parts of the developing world, women with a clear need for operative delivery are not able to access this.
O’Driscoll and Meagher seemed to have discovered the perfect solution to prolonged labour by introducing an ‘active management’ package\textsuperscript{15}, which maintained a low caesarean section rate envied by many. Caesarean section rates of 5–7% led to worldwide interest in what has been known as the Dublin Approach. This active management package has become synonymous with early use of amniotomy and syntocinon to achieve a rate of cervical dilatation of at least 1 cm/h. The protocol also depended on accurate diagnosis of labour, a constant support person, the recognition of a latent and active phase in the second stage of labour and peer reviewed audits.

The active management package also places a large emphasis on a high level of support during labour, a factor which has been shown in other studies to be associated with shorter labours, higher rates of normal vaginal delivery and a reduction in the analgesia used\textsuperscript{26}. Klaus et al speculated that increased levels of adrenaline are associated with anxiety and prolonged duration of labour\textsuperscript{26}. Therefore, social support may lessen anxiety, reducing adrenaline concentrations and thus shortening labour. These Guatemalan studies could be criticized due to the unrepresentative study samples but further, more representative studies have, however, confirmed both the short- and long-term benefits of constant companionship in labour\textsuperscript{27}.

Clinical trials to test the active management approach are few. Meta-analysis of the randomized clinical trials on specific components of active management shows that oxytocin augmentation does not improve caesarean section rates, operative vaginal delivery rates or neonatal outcome\textsuperscript{28}, but does increase hyperstimulation and the amount of pain experienced by the woman\textsuperscript{29}. Amniotomy, although showing a minimal reduction in labour duration, does not appear to affect perinatal outcome or operative delivery rates\textsuperscript{30}.

Randomized studies to evaluate the efficacy of the whole package of active management are extremely rare. One study which did appear to assess all aspects of the active management package was that carried out by Frigoletto et al\textsuperscript{31}. This study was probably the first to provide enough evidence to forcefully challenge the management as outlined by the Dublin group. Frigoletto randomly assigned 1934 nulliparous low risk women to either an active management group or usual-care group, before 30 weeks gestation. The components of active management were identical to those outlined by O’Driscoll et al in Dublin\textsuperscript{20}: customized childbirth classes; strict criteria for labour diagnosis; standardized labour management (which included early amniotomy and treatment with high dose oxytocin); and one-to-one nursing support.

Women with full-term, uncomplicated pregnancies who presented in spontaneous labour (the protocol-eligible subgroup), who had been assigned to the active management group were admitted to a separate unit.
Despite the ‘active management package’, no differences were found between groups in the rate of caesarean section, either among all women or in the protocol-eligible subgroup. However, the median duration of labour was shorter in the protocol-eligible subgroup by 2.7 h and the rate of maternal fever was lower (7% versus 11%, \( P = 0.007 \)). There were three times as many women whose labour lasted more than 12 h in the usual-care group than in the active management group (26% versus 9%, \( P < 0.001 \)). From this study, one may conclude that active management of labour may not reduce caesarean section rates but it may be associated with some outcomes which may be considered as favourable. Frigoletto et al do acknowledge the possibility of the Hawthorne effect contributing to their findings. That is, because they were focused on caesarean section rates, the overall caesarean section rate was reduced. They did evaluate this potential effect retrospectively and found no differences in mode of delivery and oxytocin use between the usual-care group who were protocol-eligible and all low risk women who delivered their first baby during the 6 months preceding trial commencement. The conclusion from Frigoletto et al was that their data do not provide adequate justification for the universal recommendation of active management of labour. Their study contributes to the many controversial debates surrounding labour management.

Operative delivery

When there is clear evidence of obstruction in the first stage of labour, delivery by caesarean section is usually required. A number of Cochrane systematic reviews, completed or in progress, assess the best evidence for different techniques. Antibiotic prophylaxis is important.\(^ {32} \)

Symphysiotomy has been a controversial procedure but may well have a role in management of obstructed labour.\(^ {33} \) An important advantage is that women who are suitable for this procedure will not enter future pregnancies with a scar on their uteruses.

Repair of fistulas

There can be no more satisfying surgical procedure in obstetrics and gynaecology than the successful repair of an obstetric fistula. James Marion Sims carried out the first surgical repair in the USA in 1849. There are a number of recent accounts of the techniques for the surgical repair of obstetric fistulas.\(^ {34} \) The illustrated monograph of Waaldijk is particularly good as a practical guide.\(^ {35} \) There remains a need for training of surgeons in some areas of the world in which this dreadful complication...
of obstructed labour still occurs. Experience in Ethiopia has shown that surgeons do not necessarily need to have medical qualifications.

Conclusions

Obstructed labour remains an important cause of maternal and fetal mortality and morbidity in many parts of the world. Better understanding of the pathophysiology of myometrial contractility in obstructed labour is important—but much can be done at the moment, even with simple clinical facilities, to identify dystocia and to treat it appropriately. Ultimately, the incidence of obstructed labour will be minimized by ensuring adequate nutrition for girls and young women.

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