

Expectant Management of Missed Miscarriage

Andi Anggeriana Andi Asri*,^{1,3} Noor Azmi Mat Adenan,² Ali Jafarzadeh Esfehiani,³
Norhafizah Mohtaruddin,⁴ Ma Saung Oo,¹ Latiffah A. Latiff³

¹Department of Obstetrics and Gynaecology, Faculty of Medicine & Health Sciences,
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

²Department of Obstetrics and Gynaecology, Faculty of Medicine,
University of Malaya, Kuala Lumpur, Malaysia

³Cancer Resource and Education Center, Universiti Putra Malaysia,
43400 UPM Serdang, Selangor, Malaysia

⁴Department of Pathology, Faculty of Medicine & Health Sciences,
Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

ABSTRACT

Early pregnancy losses occur in 10-20% of all pregnancies. Surgical evacuation has always been the mainstay of management of miscarriages. The main aim of this study was to understand the success rate of expectant management of miscarriage with regards to gestational sac size and period of gestation. The secondary outcome was to measure the satisfaction level and the rate of pregnancy after 6 month of expectant management. Patients diagnosed with missed miscarriages were requested to choose between expectant or surgical management. Those decided for expectant management on “wait and watch” approach were assessed weekly up to 5 completed weeks until complete miscarriage was achieved spontaneously. Surgical evacuation was performed if medically indicated or requested by the patients at any time or at the end of fifth week if complete miscarriage was not achieved. Out of 212 cases, 75 (35.4%) opted for expectant management. Complete miscarriage was achieved in 85.3% of subjects by the end of fifth weeks respectively. Mean of Gestational sac size and period of gestation was not found to influence the success rate of complete spontaneous miscarriage in the expectant management. No morbidity was recorded during the five weeks of the study period. Mean satisfaction score was 9.7±8.3. Pregnancy occurred in 47% of patients within 6 months follow up. The Receiver operation characteristic (ROC) curve analysis suggested the end of second week as the cut off for surgical intervention. This study revealed that expectant management of missed miscarriage is a reliable management of missed miscarriage within the first two weeks.

Key words: Expectant missed miscarriage, Safety, Management

INTRODUCTION

Miscarriage is a common complication of early pregnancy and occurs in about 10% to 20% of all pregnancies.^{1,2} In fact the majority of women do not even realize that they were pregnant apart from noticing a slight delay and heavier menstrual flow. Why then when pregnancy is confirmed and found non-viable, there is the compulsion to empty it?³ This practice might have been considered to be correct in the first half of the 20th century, when poor hygiene along with illegal abortion, led to high rate of infection with morbidity from septicaemia and heavy bleeding.^{3,4} Undoubtedly, antibiotics and newer surgical techniques have made surgical evacuation a much safer procedure. However, although rare, complications such as perforation of the uterus, leading to haemorrhage, injury to bowel, endometritis and Asherman's syndrome still occur.^{5,6}

Studies in the past 30-40 years have proven the viability and efficacy of expectant management as an alternative to surgical evacuation to a variable success.^{7,8,9} Expectant management avoids surgical procedure and costs, minimizing disruption of routine activities and is more acceptable to most women.^{10,11} The MIST trial concluded that the rates of gynaecological infection were reassuringly low irrespective of following surgical, expectant or medical management (2-3%).¹²

There were not many studies looking at the natural history of missed miscarriages^{10,11,13,14} and this study was conducted to observe the outcome of missed miscarriage on “wait and watch” approach, to comprehend the safety duration for expectant management before embarking to surgical evacuation, its potential complication, the satisfaction level and the rate of pregnancy at 6 months of follow up.

*Corresponding author: Associate Professor Dr. Andi Anggeriana Andi Asri
aanggeriana@yahoo.com.sg

PATIENTS AND METHODS

The study was prospective observational study and conducted from January 2003 until June 2005 in University of Malaya Medical Centre, Kuala Lumpur. Patients presented to the UMMC gynaecology clinic or emergency department with miscarriage at less than or equal to fourteen completed weeks of gestation based on last menstrual period (LMP) early pregnancy. Ethics approval was obtained from the Human Research Ethics Committee prior to commencement of the study. Written consent was taken from every patient.

The diagnosis of miscarriage was ultrasound-based and defined according to the guidelines published by the UK's Royal College of Obstetricians and Gynaecologists. The diagnosis of missed miscarriages were made clinically by the following criteria; showing mean gestational sac diameter of at least 15 mm without an embryonic pole or with fetal pole but without heart activity OR gestational sac diameter of less than 15 mm which remain static in size after repeating transvaginal sonography (TVS) at 7 days intervals.

The study aimed to see the natural history of missed miscarriage and also to see if expectant management was a good alternative to surgical management. We also wanted to see the return of menses and if possible, any pregnancy during the subsequent six months follows up.

The inclusion criteria of the study were age at least 18 years old (to give consent for the study), in good health, haemodynamically stable and able to continue working as usual and gestational age less than or equal to fourteen completed weeks of gestation. The exclusion criteria were severe bleeding or pain, pyrexia above 37.5°C, severe asthma, haemolytic disease or blood dyscrasias, on anticoagulation or systemic corticosteroid treatment, twin or higher order pregnancy, evidence of cervical dilatation or presence of product of conception on the external os, incomplete, inevitable or complete miscarriage, molar pregnancy, and uncertain gestational age.

These missed miscarriage women who fulfilled the inclusion criterias were given the options for expectant management or surgical intervention. Those who chose for surgical intervention underwent suction and curettage within 3 days after the diagnosis was made.

Expectant management involved a 'wait-and-watch' approach. Patients were assessed weekly until complete miscarriage was achieved spontaneously. Complete spontaneous miscarriage, was defined as the resolution of symptoms (vaginal bleeding) and the absence of RPOC (retained product of conception) or endometrial thickness less than 15 mm on follow up TVS. Women who had persistent RPOC on TVS or endometrial thickness more than 15 mm on follow up TVS at the end of 5th week or had unplanned surgical curettage were considered to have failure of expectant management. Women undergoing expectant management could change their mind at any time and opt for surgery. If, at any time during expectant management follow-up, the woman developed fever, severe haemorrhage, chills or malodorous vaginal discharge, then expectant management was terminated, antibiotic will be started and surgery arranged on the same day. Surgery involved D&E under general anesthesia. Active follow-up by telephone was continued for period of 6 months to mark the return of normal menses and identify the numbers of subsequent pregnancies.

The main outcome measures included the percentage of complete spontaneous miscarriage during each completed week, therefore the safety duration to wait for complete spontaneous miscarriage can be suggested; the percentage of patients who has failure of expectant management at the end of fifth week; the success rate of expectant management compared with mean gestational sac and mean period of gestation. The secondary outcomes were to obtain the satisfaction level and the fertility rates after expectant management of missed miscarriage. Satisfaction rate was calculated based on the subjects' response to the question "How do you rate your satisfaction from expectant management of your miscarriage from the scale of 1 to 10, when 1 indicates no satisfaction and 10 indicating high level of satisfaction?". The mean score for satisfaction was used in the study while the scores were divided into low level of satisfaction (scores below 5) and high level of satisfaction (scores above 6). Fertility rate was defined as having documented pregnancy within 6 months from miscarriage.

Statistical analysis

The statistical package for social sciences (SPSS) software version 21.00 (IBM Inc, Chicago, IL, USA) was used for the analysis. Data were checked for normality using the Shapiro-Wilk test. Mean and standard deviation (SD) were used for parametric variables while median and interquartile range (IQR) was used for non-parametric variables. Frequency and percentage was used for categorical variables. Receiver operation characteristic (ROC) curve analysis was performed to identify the cut-off point for surgical intervention. The p values of lesser than 0.05 were considered as statistically significant.

RESULTS

A total of 352 subjects with confirmed missed miscarriage were identified, 212 (60%) met all the inclusion criteria of the study. However, only 75 (35.37%) of them chose expectant management and willing to be on weekly follow up. Demographic characteristics of study subjects are shown in Table 1. Mean gestational age of the subjects was 10.4 ± 1.7 weeks.

Table 1: Demographic data on the patients

		Mean±SD	Range	Frequency (%)
Age (y)		31.5±5.9	19-43	-
Parity	Primigravida	-	-	23 (30.7)
	Mutigravida	-	-	52 (69.3)
Previous pregnancies		1.0 (3.0)*	0-6	-
Positive history for miscarriage		-	-	16 (21.3)
Gestational age	Up to 10 week	-	-	28 (37.3%)
	>10 to 14 week	-	-	47 (62.7%)
Gestational sac size (mm)		30.0 (11.0)*	20-50.5	-

SD=Standard deviation, y= year, mm= millimetre

* Median and interquartile range was displayed since the data was not normally distributed.

Out of 75 subjects who chose expectant management, 64 (85.3%) achieved complete spontaneous miscarriages by the end of the fifth week (Figure 1). The mean time needed from diagnosis to successful complete spontaneous miscarriage was $10.9 \pm$ days (ranged from 1 to 34 days).

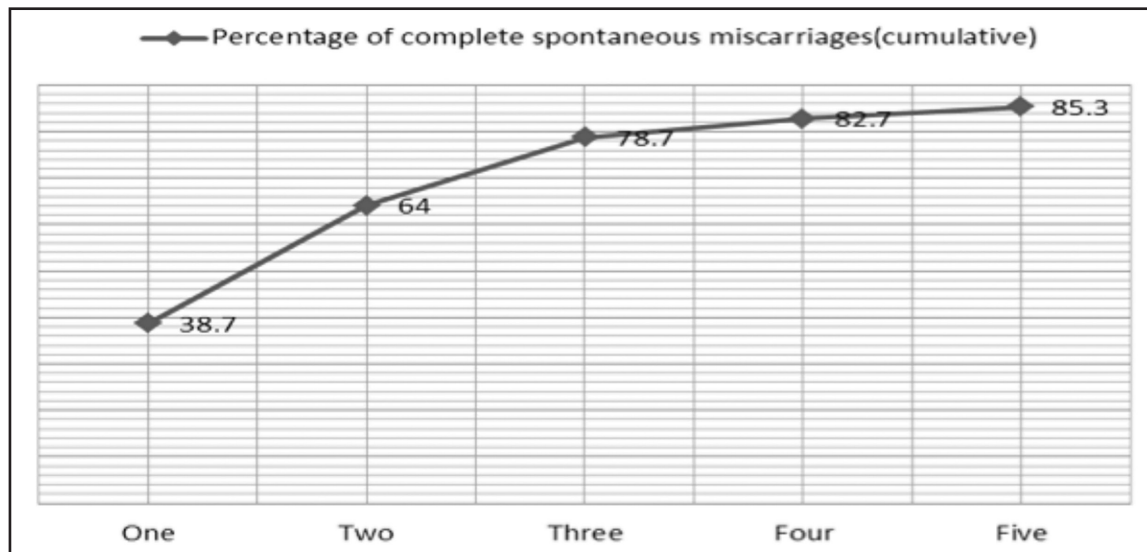


Figure 1: Outcome of expectant management over time in completed weeks

Eleven of the 75 women had surgical intervention. Ten (90.9%) were due to the request of the patients and one was due to failure to achieving complete spontaneous miscarriage at the end of the 5th week. The frequency of unplanned surgical evacuation increased as the week progresses and peaked at the end of the third week.

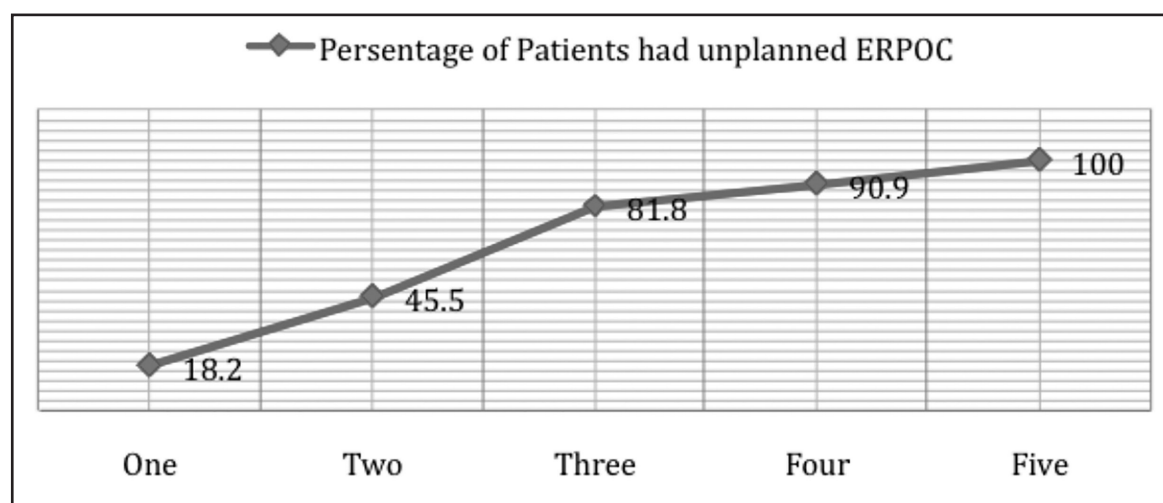


Figure 2: Percentage of Patients had Unplanned ERPOC

Age of gestation and gestational sac size did not seem to have any effect on determining the success rate of spontaneous complete miscarriages on expectant management of missed miscarriage ($p=0.52$ and $p=0.07$ respectively) (Table 2). The median (IQR) duration of bleeding was 9.00 (11.00) days. Mean satisfaction score was 9.7 ± 8.3 with all subjects (100%) reporting high level of satisfaction (Table 2).

Table 2: Effect of gestational age on the success of expectant management

		Outcome of expectant management	
		Failed	Successful
Period of gestation	≤10 weeks (28)	3 (10.7%)	25 (89.3%)
	>10 weeks (47)	8 (17.1%)	39 (82.9%)
Gestational sac size	≤30mm (39)	3 (7.7%)	36 (92.3%)
	>30mm (36)	8 (22.2%)	28 (77.8%)
Satisfaction level	Low	0 (0%)	1 (2%)
	High	11 (100%)	63 (98%)

Pregnancy occurred in 35 (47%) of subjects within 6 months follow up (Figure 3). Failure or successful of expectant management of missed miscarriages did not affect the pregnancy rate.

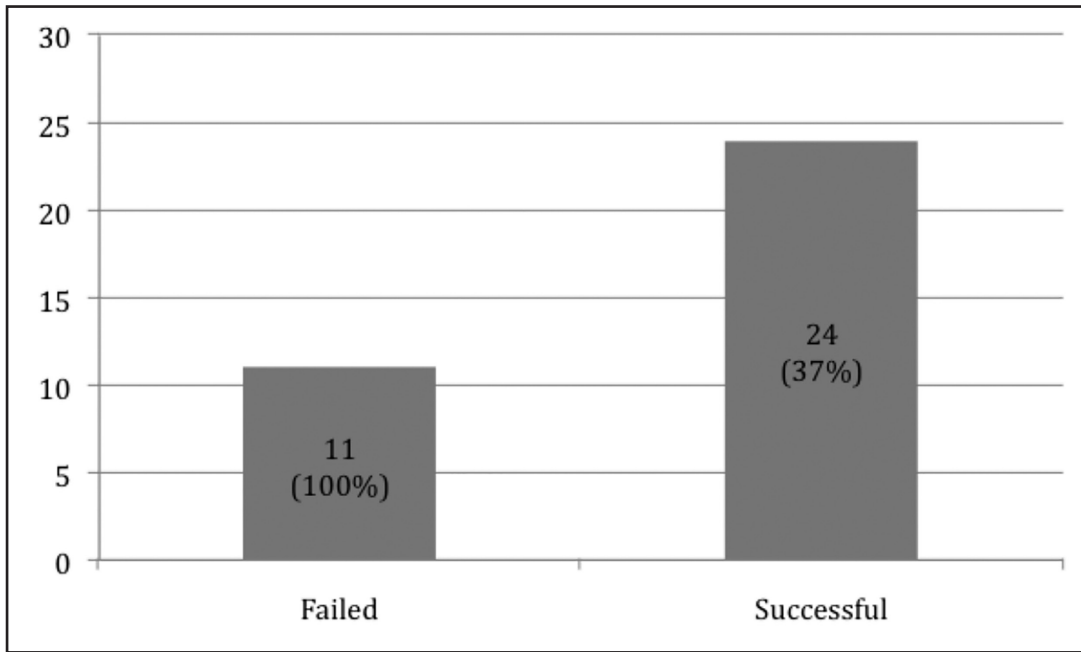


Figure 3: Frequency distribution of pregnancy within 6 months in study subjects

The ROC curve analysis revealed that the day 13 could be used as the cut-off for surgical intervention with 72.7% sensitivity and 68.7% specificity when success in expectant management was used as outcome (Figure 4).

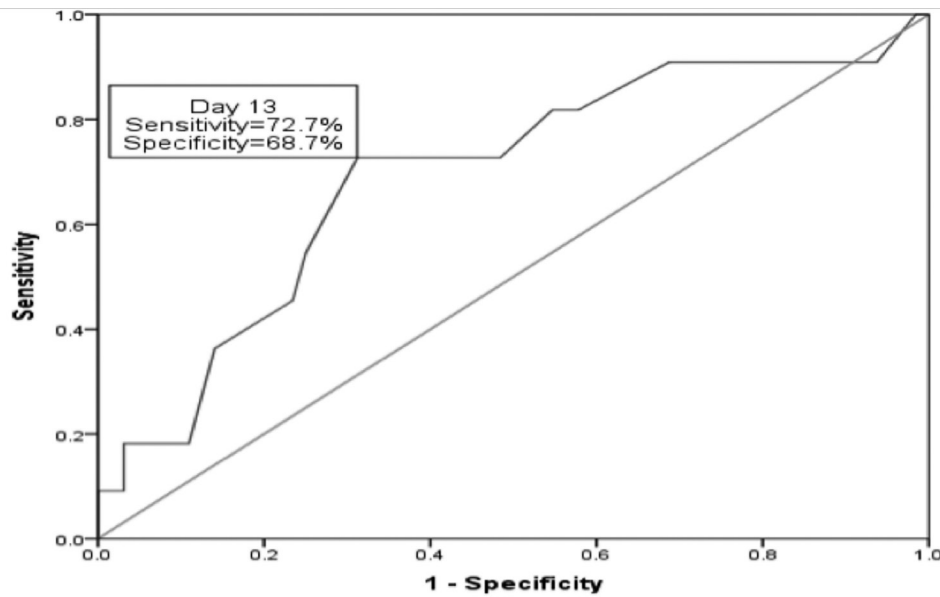


Figure 4: ROC curve for duration of expectant management of missed miscarriage till the end of pregnancy

DISCUSSION

Surgical management was the mainstay for any miscarriage in the past but this has been constantly debated over the past 30-40 years.³ Based on the hospital management settings in the study location, most incomplete miscarriages are managed conservatively unless bleeding significantly, but the same cannot be said about missed miscarriage. Like in most hospital settings, this procedure would be performed by the junior staff, not under direct supervision and occasionally during odd hours of the day. Tiredness, overworked coupled with inexperience is well known to invite disaster and litigation.¹⁵ Do we then need to subject the patients to potential disaster when they can be managed non-surgically, at least for the first few weeks? Studies have been conducted on various types of miscarriage, showing variable success with medical or expectant management, as alternative to surgical evacuation.^{7,12,14} Reports about the safety and viability of expectant management of incomplete miscarriage or miscarriage in general were abundant but scarce for missed miscarriage specifically.^{12,14,16,17} In order to suggest expectant management of missed miscarriage in our setting is a valid alternative, knowledge about its natural history is essential.

This study showed that the median bleeding duration was 9.00 days, which was comparable to 12.8 days found by Pierotic M et al.¹³ In fact, waiting period of one week could have avoided surgical evacuation in as many as 38.7% and this was comparable to 58% reported by Rafi et al.¹⁸

This study revealed that there was no association between outcome of expectant management of missed miscarriage to gestational age and gestational sac size. Similarly, previous studies also found gestational sac size was not associated with the outcome of missed miscarriage.^{19,20} In contrast, Jurkovic et al found in their 85 subjects that expectant management in lower gestational age is associated with higher success rate.¹⁴ This difference will require bigger study subjects in the future in order to have a better understanding about the outcome of missed miscarriages in relation to gestational age and may be size.

After four weeks of expectant management of missed miscarriage, our success rate was 82.7% which was higher than that found by Jurkovic et al (24.7%) and Acharya et al (53.5%).^{14,19,21} The results of this study also suggest that gestational age did not seem to have any bearing on the potential outcome of expectant management of missed miscarriage ($p=0.52$). This finding also concurred to that found by Luise et al. and Acharya et al.^{19,21} The success rate in general improved with time and the chance of achieving complete spontaneous miscarriage doubled to 78.7% by the end of third week.^{19,21} By then, most women would have become impatient and would have requested for evacuation. It has been previously suggested that expectant management should be tried for two weeks, for missed miscarriage before any surgical evacuation is considered.²² This cut-off was defined based on the observed complications and success rates of expectant management of missed miscarriage compared with surgical evacuation.²² In fact our study ROC curve analysis showed 13 days as the cut-off point for expectant management of missed miscarriage (with 72.7% sensitivity and 68.75% specificity) and within the previously suggested 2 weeks period.²² Furthermore, our study revealed that five weeks of expectant management of missed miscarriage was not accompanied with any complications, or report of morbidity such as infection or heavy vaginal bleeding amongst the subjects during the five weeks study period. This could mean that delaying surgical evacuation till the end of fifth weeks is safe and may avoid the need for evacuation, although the success rate is lower after two weeks as suggested by the ROC curve analysis.

In this study positive history of miscarriage was reported in 21.3% of the subjects, which was comparable with the incidence of early pregnancy losses.²³ This study revealed a high satisfaction level (all of the subjects scoring their satisfaction to be higher than 6) for expectant management of missed miscarriage. The finding was in line with previous study done by Niinimaki et al. (2006), 88% of them revealed a high satisfaction rate.^{24,25}

This study also revealed that 47% of the subjects became pregnant within 6 months after their miscarriage. Previous studies indicated different fertility rates after miscarriage due to different follow up durations.^{26,27} While 6 year follow up revealed normal fertility rate (97.7%), shorter duration of follow up revealed lower fertility rate after miscarriage which ranged from 81.3% after 4 years and 75.2-76.2% within 12 months.^{26,27} These findings suggest that the fertility rate increases by increasing the follow up period. Moreover it was shown that the history of miscarriage alone may not be an important predictor of recurrent miscarriage while maternal age was found to be significantly associated with increased risk of miscarriage in the next pregnancy.²³ Lower fertility rate in this study might be due to the short follow up period in this study.

One of the limitations of this study was the small sample size which was due to the small number of patients who were referred to the study hospital within the study period. However, the findings of this study were mostly in line with the findings of previous studies which were performed on similar numbers of subjects. It is recommended for further research to perform case-control studies in order to assess the benefits of expectant management of missed miscarriage compared with surgical intervention. Constraint on space and staff do not allow a dedicated early pregnancy assessment unit (EPAU) to be made available, that would allow personalize and easy access to health care. It is anticipated that creation of this unit would definitely improve the uptake of expectant management and therefore avoiding unnecessary surgical procedure in majority of cases.

Most miscarriage resolve spontaneously with time and maximal success rate is achieved around 13 days. Thereafter, success rate is lower but still a reasonably safe option to wait till end of the third week with anticipated success rate of 75%. Majority of women reported high satisfaction rate and appear to have good subsequent pregnancy rate even at a short six month follow up.

ACKNOWLEDGEMENT

The authors would like to thank all the doctors and staff in the Department of Obstetrics and Gynaecology, University of Malaya Medical Centre and the medical record office who helped in getting the cases and notes for the study. Without their help this study would be very difficult to carry out.

REFERENCES

1. Griebel CP, Halvorsen J, Golemon TB, Day AA. Management of spontaneous abortion. *Am Fam Physician*. 2005;72(7):1243–50.
2. Ammon Avalos L, Galindo C, Li D-K. A systematic review to calculate background miscarriage rates using life table analysis. *Birt Defects Res A Clin Mol Teratol*. 2012;94(6):417–23.
3. Ballagh SA, Harris HA, Demasio K. Is curettage needed for uncomplicated incomplete spontaneous abortion? *Am J Obstet Gynecol*. 1998;179(5):1279–82.
4. Malik A, Nessa K, Begum R. Septic Abortion and Associated Morbidity and Mortality. *Chattagram Maa-O-Shishu Hosp Med Coll J*. 2013;12(3):20–2.
5. Greer IA. Evidence over hope for pregnancy complications. *Blood*. 2012;119(14):3192–3.
6. Graham A, Devarajan S, Datta S. Complications in early pregnancy. *Obstet Gynaecol Reprod Med*. 2015;25(1):1–5.
7. Shelley JM, Healy D, Grover S. A randomised trial of surgical, medical and expectant management of first trimester spontaneous miscarriage. *Aust N Z J Obstet Gynaecol*. 2005;45(2):122–7.
8. Al-Ma'ani W, Solomayer E-F, Hammadeh M. Expectant versus surgical management of first-trimester miscarriage: a randomised controlled study. *Arch Gynecol Obstet*. 2014;289(5):1011–5.
9. Barcelo F, De Paco C, LÓPEZ-ESPÍN JJ, Silva Y, Abad L, Parrilla JJ. The management of missed miscarriage in an outpatient setting: 800 versus 600 µg of vaginal misoprostol. *Aust N Z J Obstet Gynaecol*. 2012;52(1):39–43.
10. Torre A, Huchon C, Bussieres L, Machevin E, Camus E, Fauconnier A. Immediate versus delayed medical treatment for first-trimester miscarriage: a randomized trial. *Am J Obstet Gynecol*. 2012;206(3):215–e1.
11. Jurkovic D, Overton C, Bender-Atik R, others. Diagnosis and management of first trimester miscarriage. *BMJ*. 2013;346:f3676.
12. Trinder J, Brocklehurst P, Porter R, Read M, Vyas S, Smith L. Management of miscarriage: expectant, medical, or surgical? Results of randomised controlled trial (miscarriage treatment (MIST) trial). *BMJ*. 2006;332(7552):1235–40.
13. Pierotic M, Silva S, Rojas I, Henríquez R, Poblete A. [Expectant management of missed abortion]. *Rev Chil Obstet Ginecol*. 1993;59(2):73–7.
14. Jurkovic D, Ross JA, Nicolaides KH. Expectant management of missed miscarriage. *BJOG Int J Obstet Gynaecol*. 1998;105(6):670–1.

15. Gandhi TK, Kachalia A, Thomas EJ, Puopolo AL, Yoon C, Brennan TA, et al. Missed and delayed diagnoses in the ambulatory setting: a study of closed malpractice claims. *Ann Intern Med.* 2006;145(7):488–96.
16. Verburg BO, Steegers EAP, De Ridder M, Snijders RJM, Smith E, Hofman A, et al. New charts for ultrasound dating of pregnancy and assessment of fetal growth: longitudinal data from a population-based cohort study. *Ultrasound Obstet Gynecol.* 2008;31(4):388–96.
17. Verschoor MA, Lemmers M, Wekker MZ, Huirne JA, Goddijn M, Mol BWJ, et al. Practice Variation in the Management of First Trimester Miscarriage in The Netherlands: A Nationwide Survey. *Obstet Gynecol Int.* 2014.
18. Rafi J, Khalil H. Expectant Management of Miscarriage in View of NICE Guideline 154. *J Pregnancy* [Internet]. 2014 [cited 2015 Feb 9];2014. Available from: <http://www.hindawi.com/journals/jp/2014/824527/abs/>
19. Acharya G, Morgan H. Does gestational sac volume predict the outcome of missed miscarriage managed expectantly? *J Clin Ultrasound.* 2002;30(9):526–31.
20. Casikar I, Lu C, Oates J, Bignardi T, Alhamdan D, Condous G. The use of power Doppler colour scoring to predict successful expectant management in women with an incomplete miscarriage. *Hum Reprod.* 2012 Mar 1;27(3):669–75.
21. Luise C, Jermy K, May C, Costello G, Collins WP, Bourne TH. Outcome of expectant management of spontaneous first trimester miscarriage: observational study. *BMJ.* 2002;324(7342):873–5.
22. Casikar I, Bignardi T, Riemke J, Alhamdan D, Condous G. Expectant management of spontaneous first-trimester miscarriage: prospective validation of the “2-week rule.” *Ultrasound Obstet Gynecol.* 2010;35(2):223–7.
23. Bhattacharya S, Bhattacharya S. Effect of miscarriage on future pregnancies. 2009; 116(8):1140-1141.
24. Hezelgrave N, Abbott D, Shennan A. Challenging Concepts in Obstetrics and Gynaecology: Cases with Expert Commentary. Oxford University Press; 2014. 363 p.
25. Niinimäki M, Jouppila P, Martikainen H, Talvensaari-Mattila A. A randomized study comparing efficacy and patient satisfaction in medical or surgical treatment of miscarriage. *Fertil Steril.* 2006 Aug;86(2):367–72.
26. Hassan MAM, Killick SR. Is previous aberrant reproductive outcome predictive of subsequently reduced fecundity? *Hum Reprod.* 2005;20(3):657–64.
27. Adelusi Ea Bamgboye N. Chowdhury L. Al-Nuaim B. Pregnancy trends after abortion. *J Obstet Gynecol.* 1998;18(2):159–63.