ORIGINAL ARTICLE

Morbidly adherent placenta: One-year case series in a tertiary hospital

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ABSTRACT

Objective: To analyse the clinical characteristics of patients with morbidly adherent placenta (MAP). Findings of this study will be used to identify patients at risk of MAP and to outline the best management strategy to deal with this devastating condition.

Methods: Delivery records in Hospital Sultanah Nur Zahirah, Terengganu from 1st. January 2016 until 31st. December 2016 were reviewed and analysed.

Results: Out of the 15,837 deliveries, eight cases of MAP were identified. Six out of eight patients had previous caesarean scar with concomitant placenta praevia, the other two patients had previous caesarean scar with history of placenta praevia in previous pregnancies. Seven out of eight cases were suspected to have MAP based on risk factors. Correct diagnosis was made by ultrasound in five patients, all with histologically confirmed moderate/severe degree of abnormal placentation. The other two cases of 'unlikely MAP', demonstrated segmental MAP intra-operatively with histologically confirmed milder degree of abnormal placentation. Total intraoperative blood loss ranged from 0.8 to 20 litres. Prophylactic internal iliac artery balloon occlusion was associated with significantly less blood loss.

Conclusion: Antenatal diagnosis is essential in outlining the best management strategy in patients with MAP. Ultrasound may not be accurate in ruling out lower degree of MAP. Apart from having a scarred uterus with concomitant placenta praevia, history of having placenta praevia in previous pregnancy is also a risk factor for MAP. Prophylactic internal iliac artery balloon occlusion is associated with significantly less blood loss and should be considered in cases suspected with MAP.

KEY WORDS:
morbidly adherent placenta (MAP), hysterectomy, ultrasound, MRI, internal iliac artery balloon occlusion

INTRODUCTION

Managing morbidly adherent placenta (MAP) can be one of obstetrician's worst nightmares as it is associated with significant severe maternal morbidity and one of the recognised causes of maternal death. To make matters more complex, the incidence of MAP has increased over the years. In 1950 the incidence of MAP in the United States was 1 in 30,000 deliveries compared to 1 in 731 deliveries between 2008 and 2011.[1,2]

Two very important risk factors in the occurrence of MAP are previous caesarean delivery and concomitant placenta praevia. Therefore, it is not surprising that the incidence of MAP increases proportionally to the number of caesarean sections. One study quoted a 10-fold increase in the incidence of MAP in the last 50 years mainly due to the rise in the caesarean section rates.[3]

Severity of MAP is described according to the depth of invasion of the chorionic villi into the myometrium. In placenta accreta, the villi are attached but do not invade myometrium. In the case of placenta increta the villi partially invade the myometrium while in cases of placenta percreta, villi penetrate through the entire thickness of the myometrium or beyond the serosa layer of the uterus. The exact pathogenesis of MAP is not known but several hypotheses were proposed including mal-development of decidua, excessive of trophoblastic invasion, or a combination of both.[4]

Caesarean hysterectomy is the management of choice in most cases of MAP. Conservative surgery is usually reserved in selected cases where fertility preservation is desired.

METHODS

Hospital Sultanah Nur Zahirah (HSNZ) is the only tertiary hospital in the state of Terengganu, Malaysia. The total number of deliveries in 2016 was 15,837 with caesarean section rate of 20.33%.

This retrospective study analysed all cases of caesarean sections between 1st. January 2016 and 31st. December 2016 which culminated with caesarean hysterectomy. Clinical information was retrieved from (HSNZ) hospital information system database and caesarean delivery database. Diagnosis of MAP was confirmed by histopathological examination of the hysterectomy specimens. Eight cases of confirmed MAP were studied.

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Table I: Clinical characteristics of 8 MAP patients

Case	Age	Parity	BMI	AN problems	Risk factors	US	MRI	Complications	TBL(L), Tx+ DIVC	HPE
1	38	3	31	-	- 2 previous LSCS scars (history: placenta praevia major)	-	-	External iliac vein injury, Re-laparotomy & Packing , Wound breakdown	15, 12+2	Percreta
2	34	3	30	GDM	- 2 previous LSCS scars - Placenta praevia type IV	Y	Y	-	9, 12+1	Percreta
3	33	3+1	45	-	- 2 previous LSCS scars - Placenta praevia type IV - History D&C	Y	Y	External iliac vein injury and ligation, Abdominal packing, DVT	20, 22+4	Increta
4	35	3	31	GDM	- 2 previous LSCS scars - Placenta praevia type IV	Y	Y	Ureteric injury, Abdominal Packing , Wound breakdown	20, 20+3	Percreta
5	36	3	28	Asthma	- 2 previous LSCS scars - Placenta praevia type III	N	-	Segmental MAP 4X4cm, Abdominal Packing	10, 8+1	Accreta (segmental 4x4cm)
6	38	5	21	-	- 1 previous LSCS scar (history: placenta praevia major) - Placenta praevia type III	Y	Y	Bladder injury	4, 6+2	Increta
7	28	3	21	GDM	- 2 previous LSCS scars - Placenta praevia type III	Y	Y	Re-laparotomy (bleeding from vascular pedicles)	0.8, -	Percreta
8	38	3	42	GDM, HDP, Asthma	- 2 previous LSCS scars - Placenta praevia type III posterior	N	-	Retroperitoneal haematoma, Pulmonary oedema	16, 12+3	Accreta (segmental 3x4cm)

Note: AN problems: antenatal problems, US: ultrasound, MRI: magnetic resonance imaging, Y: yes, N: no, DVT: deep vein thrombosis, TBL (L): total blood loss intraoperatively in litres during hysterectomy, Tx: total units of blood transfused, DIVC: total units of DIVC cycles transfused, BMI: body mass index, GDM: gestational diabetes, HDP: hypertension during pregnancy

Table II: Characteristics and risk factors in 8 MAP patients

		Value*
Characteristics	Age	35 (28-38)
	Parity	3 (3-5)
	BMI	32.75 (21-45)
Risk factors	Concomitant placenta praevia	7/8
	Previous 1 LSCS	1/8
	Previous 2 LSCS	7/8
	Previous uterine curettage	1/8
Correct Prenatal Diagnosis	Ultrasound	5/7
	MRI	5/5

*Values are expressed as mean (range) or number, BMI: body mass index, LSCS: lower segment caesarean section, MRI: magnetic resonance imaging

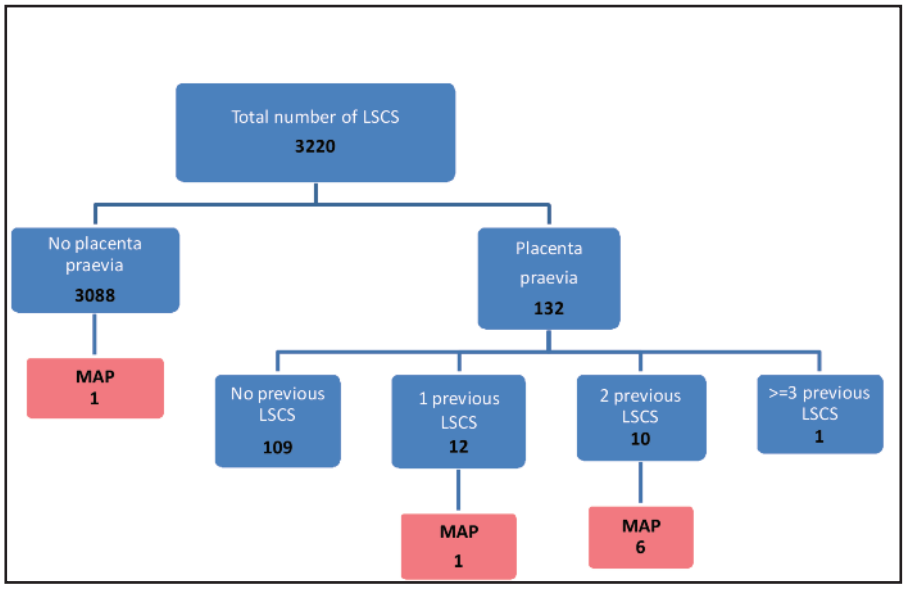

Fig. 1: Indication of LSCS and number of patients with MAP
Note: MAP: morbidly adherent placenta, LSCS: lower segment caesarean section

RESULTS

The incidence of MAP in this institution in 2016 was 0.05% of the total deliveries or nearly 1 in every 2000 deliveries. The total number of caesarean deliveries in 2016 was 3220 cases. Placenta praevia was the indication for caesarean deliveries in 4% of these patients (Figure 1).

Out of 12 patients with placenta praevia and one previous lower segment caesarean section (LSCS), one patient developed MAP. Interestingly in this patient, the indication of her previous LSCS was also for placenta praevia. Previous caesarean scars in the remaining 11 patients were for other obstetric indications.

In patients who had placenta praevia with a history of two previous LSCS, six out of 10 patients developed MAP. In this group of patients, the risk of MAP was at least seven times higher compared to patients with placenta praevia with a history of one previous LSCS.

One patient with placenta praevia with a history of three previous LSCS ended with caesarean hysterectomy following massive bleeding due to atonic uterus. However, histopathological examination did not demonstrate any areas of MAP.

Among the eight patients with MAP, one patient had a history of two caesarean scars without concomitant placenta praevia. The indication for both her earlier caesarean deliveries were for placenta praevia major.

Demographic data and clinical characteristics of the eight patients with MAP are presented in Table I and Table II.

Most patients were in their thirties with mean age of 35 years. These patients were para-3 except in one case (para-5). Five out of the eight patients were obese with mean BMI of 32.75. Half of the patients have gestational diabetes.

Based on the risk factors for MAP, seven patients underwent a thorough sonographic evaluation by a senior obstetrician. Five out of the seven patients suggestive of possible MAP by ultrasound, proceeded with MRI examination. Histology of the hysterectomised specimens later confirmed severe degree of placentation i.e. placenta increta/percreta in these five patients. The other two patients in whom ultrasound findings

were 'unlikely MAP' did not undergo MRI examination. These two cases demonstrated segmental MAP intra-operatively and interestingly, lower degree of abnormal placentation, i.e. placenta accreta was confirmed histologically.

Caesarean hysterectomy was the operation of choice and there was no attempt to conserve the uterus since none of the patients desired for another pregnancy. Mean (SD) blood loss during the procedure of all patients was 11.85 (7.12) litres. The patients with bilateral internal iliac artery balloon occlusion lost the least amount of intraoperative blood loss (case number 6 (4 litres) and 7 (0.8 litres)). Nevertheless, several hours post operation, re-laparotomy was performed in patient number 7. Intraoperative findings were bleeding from a loosely tied vascular pedicle.

Complications included intraoperative organ/vascular injuries (bladder, ureter, external iliac vein), re-laparotomy, DVT and wound breakdown.

DISCUSSION

The incidence of MAP in our series of cases was 0.24% of caesarean deliveries. Another author have quoted higher incidence of MAP of up to 0.31% of caesarean deliveries.[5] Morlando et al., examined the incidence of MAP from 1970s to 2000s[5] and his group found that MAP rates had increased from 0.12 to 0.31% consistent with the rise of caesarean section rates from 17 to 64%. In Malaysia, Hospital Raja Perempuan Bainun Ipoh recorded the highest LSCS rate that of 61.8% while in Hospital Kuala Lumpur's the LSCS rate was 32.09%.[6] Our LSCS rate is still among the lowest in Malaysia being at 20.33%. We do not have data on MAP in other hospitals in Malaysia, for it would be very interesting to see the pattern of MAP between the hospitals with different LSCS rates.

Up to 88% of the women with placenta accreta have concomitant placenta previa.[1,2,7,8] This does not differ from our series where seven out of eight patients (87.5%) have concomitant placenta praevia. In the presence of placenta praevia, the risk of placenta accreta was 3%, 11%, 40%, 61% and 67% for the first, second, third, fourth, and fifth or greater repeat caesarean deliveries, respectively.[9] Six out of our eight MAP patients had two previous caesarean sections. There was only one patient with placenta praevia with a history of more than two previous caesarean sections who apparently did not have a MAP. Many of our patients would have undergone sterilisation during the third caesarean according to the policy of the Hospital. Therefore, we hardly see patients with a history of more than two previous caesarean sections.

All patients with MAP in our series had concomitant placenta praevia in the current pregnancy except for one case. This particular patient had a normally located placenta and the only risk factor for MAP in her was a history of two previous LSCS. The indications for previous caesarean deliveries were studied, and in this case, both LSCS were performed for placenta praevia major. On the other hand, out of 12 patients who have a history of one previous LSCS and concomitant placenta praevia, only one patient developed MAP. Placenta praevia major was also the indication for her previous LSCS as compared to other patients who underwent caesarean deliveries for other obstetrics indications. Our study therefore seems to suggest that past history of having placenta praevia in prior pregnancies could also be an important risk factor for future MAP.

It has been the routine practice in our centre to perform MRI once ultrasound findings indicate MAP. Ultrasound was accurate in diagnosing all cases of severe abnormal placentation. Two patients with negative ultrasound findings did not have the benefit of MRI examination. Both had lowest degree of abnormal placentation, i.e., placenta accreta. It is possible that with MRI, these two cases could have been identified preoperatively. Most studies have suggested comparable diagnostic accuracy of MRI and ultrasound, however, in cases where ultrasound findings are ambiguous or when posterior placenta accreta is suspected, ultrasonography alone may be insufficient.[10,11] MRI has been shown to be essential in defining the topography and area of placental invasion.[12] Compared to ultrasound, MRI is costly, not readily available in all centres and requires higher expertise. In a centre with low resource, MRI examination could be reserved in suspected cases with negative ultrasound findings.

Shrivastava et al., in 2007 studied two groups; 19 patients with balloon catheters plus hysterectomy against 50 patients with hysterectomy alone.[12] The two groups did not differ significantly in estimated blood loss, transfusion of blood products, operating time and post-operative hospital days. In fact, 15.8% of patients had complications from catheter placement. On the other hand, Tan et al., also in 2007 who studied 11 patients concluded that perioperative balloon occlusion placement was a safe minimally invasive technique that reduces intraoperative blood loss and transfusion requirements in patients with placenta accreta.[13] Most of our patients underwent surgery without perioperative balloon catheter placement since resident interventional radiologist was not available in our hospital. The two cases (case number 6 and 7) who had perioperative balloon catheter placed by a visiting interventional radiologist demonstrated the least amount of blood loss. It is worthy to note once perioperative balloon catheter is used, the surgeon should not be too complacent. This was illustrated in case number 7 (placenta percreta) when blood loss from hysterectomy alone was only 800mls, but the patient had to undergo relaparotomy after internal iliac artery balloon was removed due to slow bleeding from loosely tied vascular pedicles 18 hours after the initial operation.

Following this study several changes has taken place in the management of MAP in our centre. MRI is no longer mandatory for all suspected MAP cases confirmed/already verified by ultrasound examination. In suspected cases with negative ultrasound findings, MRI is performed to reduce the chance of misdiagnosing the presence of MAP. Screening for MAP in our patients include history of previous LSCS performed for placenta praevia. There is a pressing need to have a resident interventional radiologist in this centre.

CONCLUSION

Without doubt, antenatal diagnosis of MAP is imperative. Good history taking, with special attention to risk factors and performing advanced imaging modalities are vital in paving the way to the successful management of MAP.

REFERENCES

1. Miller DA, Chollet JA, Goodwin TM. Clinical risk factors for placenta praevia-placenta accreta. Am J. Obstet Gynecol 1997; 177(1): 210-4.
2. Wu S, Kocherginsky M, Hibbard J. Abnormal placentation: twenty year analysis. Am J Obstet Gynecol 2005;192: 1458-61.
3. Chou MM, Hwang JI, Tseng JJ, Ho Es. Internal iliac artery embolization before hysterectomy or placenta accreta. J Vasc Int Radiol 2003; 14(9 Pt 1): 1195-9.
4. Garmi G, Salim R. Epidemiology, etiology, diagnosis, and management of placenta accreta. Obstet Gynecol Int 2012; 2012: 873929.
5. Morlando M, Sarno L, Napolitano R, Capone A, Tessitore G, Maruotti GM et al. Placenta accreta: incidence and risk factors in an area with a particularly high rate of cesarean section. Acta Obstet Gynecol Scand 2013; 92(4): 457-60.
6. 3rd Report of National Obstetrics Registry(Malaysia) 2011-2012 page 19-20.
7. Amstrong CA, Harding S, Matthews T, Disckinson JE. Is placenta accreta catching up with us? Aust N Z J Obstet Gynaecol 2004; 44(3): 210-3.
8. Silver RM, Landon MB, Rouse DJ, Leveno KJ, Spong CY, Thom EA, et al. Maternal morbidity associated with multiple repeat cesarean deliveries.. Obstet Gynecol 2006; 107(6): 1226-32.
9. Palacios Jaraquemada JM, Bruno CH. Magnetic resonance imaging in 300 cases of placenta accreta: surgical correlation of new findings. Acta Obstet Gynecol Scand 2005; 84(8): 716-24.
10. Maldjian C, Adam R, Pelosi M, Pelosi M 3rd, Rudelli RD, Maldjian J. MRI appearance of placenta percreta and placenta accreta. Magn Reson Imaging 1999; 17(7): 965-71.
11. Kirkinen P, Helin-Martikainen HL, Vanninen R, Partanen K. Placenta accreta: imaging by gray-scale and contrast-enhanced color doppler sonography and magnetic resonance imaging. Clin Ultrasound 1998; 26(2): 90-4.
12. Shrivastava V, Nageotte M, Major C, Haydon M, Wing D. Case control comparison of cesarean hysterectomy with and without prophylactic placement of intravascular balloon catheters for placenta accreta. Am J Obstet Gynecol 2007; 197(4): 402.e1-5.
13. Tan CH, Tay KH, Sheah K, Kwek K, Wong K, Tan HK, et al. Perioperative endovascular internal iliac artery occlusion balloon placement in management of placenta accreta. AJR Am J Roentgenol 2007; 189(5): 1158-63.