

Choosing the uterine preservation surgery for placental polyp determined by blood flow evaluation: A retrospective cohort study



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ABSTRACT

Background: A placental polyp is an intrauterine polypoid mass or pedunculated mass occurring from residual trophoblastic tissue following abortion, cesarean section or vaginal delivery. Recently uterine preservation surgery represented by transcervical resection (TCR) has been performed for placental polyps. However TCR without intravascular intervention, including uterine artery embolization (UAE) may cause profound bleeding which necessitate emergency laparotomy.

Methods: Seventeen cases of placental polyp were retrospectively examined. We divided cases into two groups: strong vascularity group (n = 13) and weak vascularity group (n = 4). Mass extraction of polyp by TCR was conducted in 16 cases, 6 case without UAE and 10 cases with UAE.

Results: As for the weak vascularity group, one case was naturally resolved while planning surgery and 3 cases were treated with TCR without UAE without major intra- and/or postoperative bleeding. On the other hand in the strong vascularity group, 2 out of 3 cases of TCR without UAE resulted in major bleeding during and after the surgery, both needed transfusion and one needing postoperative UAE. Ten cases of strong vascularity group, TCR with UAE were performed and all of them were accomplished without major bleeding. TCR without UAE was safely performed in cases where there was absent or mild to moderate blood flow.

Conclusions: Our report suggests that adding UAE might be safer to treat placental polyps that have strong vascularity.

1. Introduction

A placental polyp is an intrauterine polypoid mass or pedunculated mass occurring from residual trophoblastic tissue following abortion, cesarean section or vaginal delivery (Fig. 1). Retained chorionic villi undergo necrosis with fibrin deposition over several weeks after resolution of gestation. In some cases it is accompanied by prominent neovascularization [1]. In these cases, sudden rupture of blood vessels may cause profuse hemorrhage that requires blood transfusions, interventional radiology procedures, or even life-saving hysterectomy [2,3].

Recently uterine preservation surgery, as represented by transcervical resection (TCR), has also been performed for placental polyps [4–8]. A report from Spain showed effectiveness and safety of hysteroscopic resection, in which almost all of 84 cases of placental polyp were successfully treated with TCR without intravascular intervention, such as uterine artery embolization (UAE) or temporary iliac artery balloon occlusion [5]. On the other hand, a few case series described

effectiveness of concomitant intravascular intervention to decrease blood loss during TCR [6–8]. In previous studies, UAE was shown to have unfavorable effect in future pregnancies by decreasing the chances of pregnancy and increasing pregnancy related complications such as placenta accrete [9]. For patients who wish future pregnancy, we want to minimize the use of UAE while guaranteeing safety and effectiveness in conducting TCR.

Hiraki et al. reported a small case series in which the blood flows to the polyps decreased by the time, thus by delaying surgery, they argued, that intravascular intervention could be avoided [4]. However, in this case series, two out of eight patients resulted in massive bleeding during hysteroscopy, one of them switched to laparotomy [4]. Do we need concomitant intravascular intervention, especially UAE, when treating placental polyp with TCR? The aim of this study is to compare the outcome of cases treated with UAE and those without UAE for TCR in treating placental polyp, especially focusing on how vascularity/blood flow of polyps is associated with the outcome.

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Fig. 1. Placental polyp.

2. Patients and methods

This is a single-center retrospective cohort study at Iizuka Hospital, a referral hospital with 1048 beds in rural town Iizuka, Fukuoka, Japan. Our medical center is one of the largest tertiary medical facilities in Japan. Inclusion criteria were cases which were diagnosed as placental polyp from November 2004 to October 2015 based on the findings of intrauterine polypoid mass with transcervical ultrasonography that had not been seen at the resolution of preceding pregnancy. Following cases were excluded; Cases in which blood flow analysis was not performed by either MRI or color Doppler ultrasound examination, and cases for whom hysterectomy was performed under the patients' request. Ethical approval was obtained from the ASO Iizuka Hospital. Informed written consent was waived because this study solely used the data obtained from clinical practice. The study was conducted according to the principles expressed in the Declaration of Helsinki. Patient data was obtained from clinical record regarding age at diagnosis, gravidity, parity, presenting symptoms, gestational age at terminated or achieved in the preceding pregnancy, mode of pregnancy, interval from termination of pregnancy to diagnosis of placental polyp, human chorionic gonadotropin (hCG) level at diagnosis. The extent of blood supply was evaluated with Color Doppler imaging, and/or contrasted MRI. Presence of blood flow by color Doppler was graded as absence (–), mild to moderate (1+), high (2+) and remarkable (3+). Remarkable blood flow was defined as the continuation of abundant blood flow within the polyp with the myometrial blood flow (Fig. 2). Vascularity by contrasted MRI was evaluated with the degree of enhancement: absence (–), mild to moderate (1+), high (2+) and remarkable (3+). It is reported that the degree of contrast enhancements in MRI corresponds with the degree of blood flow evaluation by color Doppler ultrasound, though minimal blood flow by color Doppler may fail to reveal contrast enhancement by MRI [4]. Overall, we divided cases into two groups: (2+) to (3+) being strong vascularity group, (–) to (1+) being weak vascularity group. The ways of management were decided between abdominal total hysterectomy (ATH), TCR with UAE, TCR without UAE based upon patients' preference, severity of the bleeding, availability of intra-vascular treatment, and at the discretion of the attending obstetrician.

With regard to the TCR, procedures were performed by experienced gynecological specialists, who were all Board Certified Member of the Japanese Society of Obstetrics and Gynecology. TCR is performed using a hysteroscope with an electrical loop at its end to remove polyps arising from the internal lining of the uterus.

For patients who underwent TCR with UAE, TCR was performed after UAE, some on the same day and the other on the next day. Radiologists performed UAE. The embolization was performed utilizing a right common femoral approach. A catheter was advanced into the



Fig. 2. Color Doppler ultrasound of blood flow within the polyp graded as high (2+) flow. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

both uterine arteries, through abdominal aorta to the right and left internal iliac arteries. Then transarterial embolization was carried out using an absorbable gelatin sponge.

We compared the outcomes of cases treated with TCR and UAE and those without UAE based on the degree of polyp vascularity.

3. Result

Twenty-six women were diagnosed as placental polyp during the 11 years. Five cases where blood flow analysis was not performed by either MRI or color Doppler ultrasound examination were excluded from analysis. We excluded four cases who did not request fertility preservation and for whom hysterectomy was performed (Fig. 3).

The clinical backgrounds of seventeen cases are shown in Table 1. The median age was 31 years old (range: 20–41). The preceding pregnancies were artificial abortions ($n = 4$), spontaneous abortion ($n = 3$), cesarean section ($n = 1$) and vaginal delivery ($n = 9$). The median period from resolution of previous pregnancy to diagnosis of placental polyp was 33 days (range: 9–392). Serum hCG level was measured in 12 cases and median hCG level was 3.5 mIU/mL (range: < 1.0 –625.1 IU/L) with 4 cases with < 1.0 mIU/mL, and 5 cases with missing data. We did not measure serum hCG levels after resolution of polyp in any of these cases. Symptom of bleeding was present in 16 cases with 8 cases with profound bleeding which required emergency transfer. Blood flow within the polyp and/or myometrium was evaluated: 7 cases both with color Doppler and contrasted MRI, 3 cases with only color Doppler, 7 cases with only contrasted MRI. The degree of contrast enhancements in MRI appeared to be corresponding with the degree of blood flow evaluation by color Doppler ultrasound, (2+) in MRI being (1+) to (2+) in color Doppler, (3+) in MRI being (2+) in color Doppler. We had 13 patients for the strong vascularity group (2+) or (3+) and 4 patients for the weak vascularity group (–) or (1+). Of 13 cases of the strong vascularity group, TCR alone was performed in 3 cases and TCR with UAE was performed in 10 cases. Of 4 cases of weak vascularity group, for one case polyp was naturally resolved while planning surgery. In the other 3 cases, TCR without UAE was conducted. Of 17 cases, tissue samples were collected from extracted polypoid mass in 11 and presence of chorionic villi was histologically confirmed in all cases.

Table 2 shows comparison of clinical background of patients in the weak vascularity group and the strong vascularity group. There shown to be no statistically significant difference between the 2 groups.

Table 3 compares the outcomes of TCR without UAE in the weak

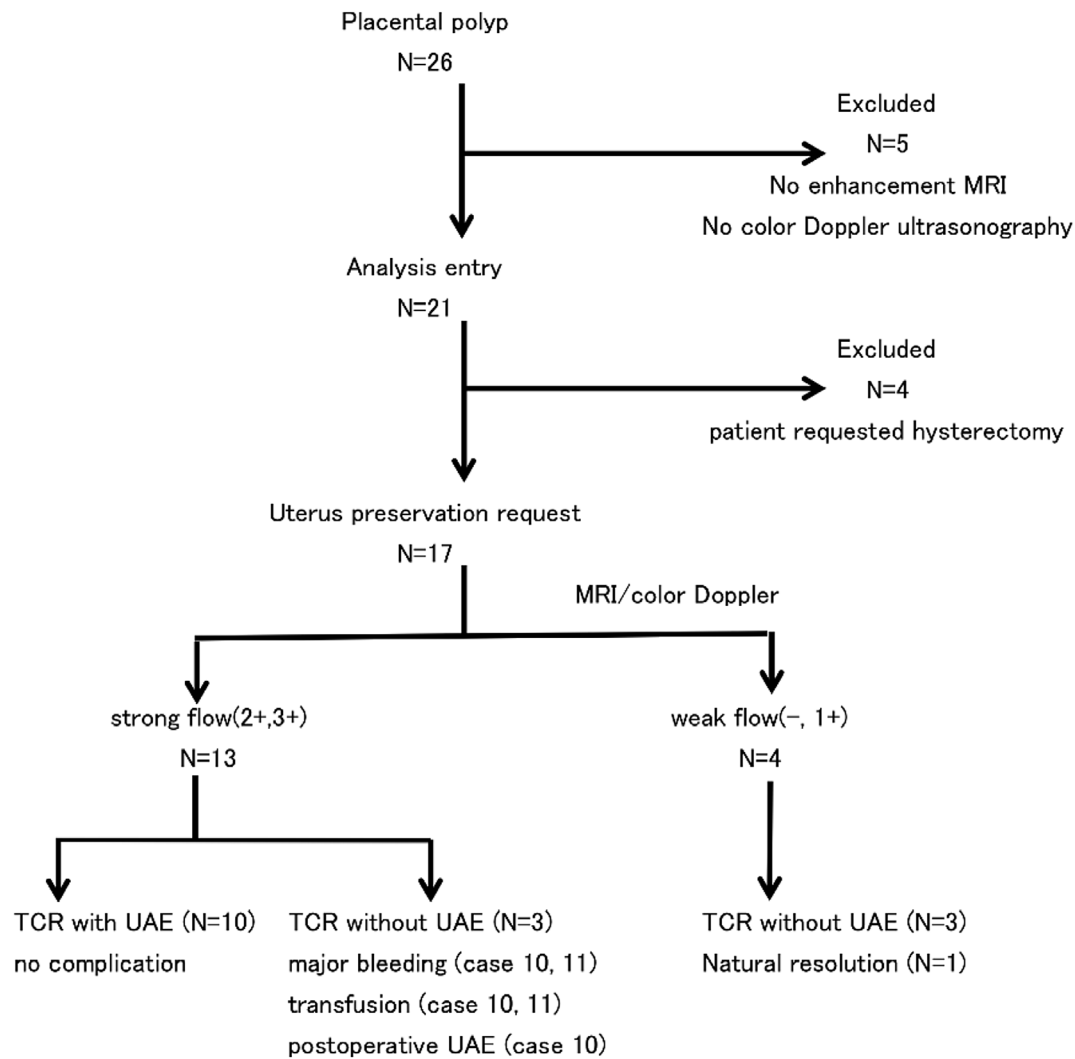


Fig. 3. Profiles of the study patients.

vascularity group (N = 3) and the strong vascularity group (N = 3) and TCR with UAE. In all groups, resection of polyps was successful in all the cases. In weak vascularity group, bleeding during the operation was

small and there was no postoperative rebleeding. On the other hand, in the strong vascularity group treated with TCR alone, 2 out of 3 cases (case 10 and 11) resulted in major bleeding during and after the

Table 1
Clinical profiles of patients with placental polyp.

	Age	G,P	Weeks	Mode	Interval	hCG	Bleeding	MRI	US doppler	vascularity	Intervention	Histology	Complication
1	33	G4P2	7	AA	60	-	+	-	NA	Weak	Observation	-	-
2	25	G3P0	14	AA	62	< 1.0	+	-	NA	Weak	TCR	○	-
3	32	G4P3	5	AA	28	8	+	1+	NA	Weak	TCR	○	-
4	29	G1P1	3	TVD	17	3.1	Profound	1+	NA	Weak	TCR	-	-
5	25	G4P2	full term	TVD	56	< 1.0	+	2+	1+	Strong	TCR	○	-
6	33	G5P3	40	TVD	40	3.9	Profound	2+	1+	Strong	UAE + TCR	○	-
7	41	G1P1	37	TVD	27	10.2	+	2+	1+	Strong	UAE + TCR	○	-
8	39	G1P1	full term	TVD	392	-	-	2+	2+	Strong	UAE + TCR	-	-
9	20	G2P1	5	SA	66	15.5	-	2+	2+	Strong	UAE + TCR	○	-
10	30	G1P1	38	CS	31	< 1.0	Profound	2+	NA	Strong	TCR	-	a
11	31	G2P1	34	TVD	21	-	Profound	2+	NA	Strong	TCR	-	b
12	28	G3P2	34	TVD	9	-	Profound	NA	2+	Strong	UAE + TCR	○	-
13	40	G1P0	12	SA	33	-	+	NA	2+	Strong	UAE + TCR	○	-
14	34	G3P3	39	TVD	19	9	Profound	NA	2+	Strong	UAE + TCR	○	-
15	28	G7P2	9	AA	46	1.4	Profound	3+	NA	Strong	UAE + TCR	○	-
16	28	G4P2	16	SA	33	< 1.0	+	3+	2+	Strong	UAE + TCR	-	-
17	34	G2P1	40	TVD	21	625.1	+	3+	2+	Strong	UAE + TCR	○	-

SA: spontaneous abortion, AA: artificial abortion, TVD: transvaginal delivery, CS: cesarean section, NA: not available, TCR: transcervical resection, UAE: uterine artery embolization.

^a Major bleeding on the following day, transfusion, postoperative UAE.

^b Major bleeding during TCR, transfusion.

Table 2
Clinical background of patients in weak vascularity group and strong vascularity group.

Median (range)	All (N = 17)	Weak vascularity group (N = 4)	Strong vascularity group (N = 13)	P value
Age	31 (20–41)	30.5 (25–33)	31 (20–41)	p = 0.624
G	3 (1–7)	3.5 (1–4)	2 (1–7)	p = 0.703
P	1 (0–3)	1.5 (0–3)	1 (0–3)	P = 1.000
Weeks	34 (5–10)	10.5 (5–38)	34 (5–40)	
Interval	33 (9–392)	44 (17–62)	33 (9–392)	p = 0.871
hCG	3.5 (< 1.0–625.1)	3.1 (< 1.0–8)	3.9 (< 1.0–625.1)	p = 0.600
Intervention				
TCR	6	3	3	
UAE + TCR	10	0	10	

Table 3
The outcome of TCR without UAE in the weak vascularity group (n = 3) and the strong vascularity group (n = 3), and TCR with UAE in the strong vascularity group (n = 10).

	TCR without UAE		TCR with UAE
	Weak vascularity group (N = 3)d	Strong vascularity group (N = 3)	Strong vascularity group (N = 10)
Successful resection	3 (100%)	3 (100%)	10 (100%)
Complications			
Bleeding	0	2 (67%)*	0
Blood transfusion	0	2 (67%)	0
Postoperative UAE	0	1 (33%)	0

surgery, and both cases needed transfusion and one (case 10) needed postoperative UAE; For case 11, the amount of bleeding during operation exceeded 300 g and blood transfusion was performed. For case 10, major bleeding occurred on the following day of TCR, which caused vital sign change, and blood transfusion and UAE were performed.

In 10 cases, TCR with UAE was performed and all of them were accomplished without of intra- and/or postoperative bleeding.

4. Discussion

Previous studies showed that UAE could have unfavorable effects in future pregnancies by decreasing the chances of pregnancy and increasing pregnancy related complications such as placenta accreta. For patients who wish future pregnancy, we want to minimize the use of UAE while guaranteeing safety and effectiveness in conducting uterine preserving surgery.

In this study, we examined the outcome of cases with UAE and those without UAE in treating placental polyp with TCR, especially focusing how vascularity/blood flow of polyps associated with the outcome. TCR without UAE was safely performed in cases where there was absent or mild to moderate blood flow. On the other hand, TCR without UAE resulted in high frequency of major bleeding in cases with abundant blood supply. Our finding showed that TCR with UAE is safe and highly effective for placental polyps that have strong vascularity.

This is the first report where insight was put into the necessity of UAE based on the evaluation of blood supply to the placental polyp. In order to decide the way of treatment, it is imperative to assess the vascularity of the mass.

We need to acknowledge several limitations. First, the number of cases is limited and this limits the generalizability of the results. However, considering that a placental polyp is a rare condition, we think that the data of 17 cases presented in the present study is important. Further larger studies were warranted in the future. Second,

because of the nature of retrospective study, some important data were missing. For example, not all cases were evaluated with color Doppler ultrasound. Further studies are needed to show the optimal treatment method for placental polyp.

5. Conclusion

Our report suggests that adding UAE to TCR might be safer to treat placental polyps with strong vascularity, rather than treating with TCR alone.

Ethical approval statement

Approval for this study was granted by the ASO Iizuka Hospital Ethics Committee.

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None.

Author contribution

Participated in the conception and design of the study: SS, TF. Analyzed the data: SS, TF. Collected data: TF, MG, MA, SI, HY, SN, YT, HK, FE, HT. TF, MG. Interpreted the data: TF, FE, TH. Drafted the initial manuscript: SS, TF. All the authors have read, contributed to and approved the final manuscript.

Conflict of interest

The authors state that they have no Conflict of Interest.

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References

- [1] A. Takeda, K. Koyama, S. Imoto, M. Mori, K. Sakai, H. Nakamura, Placental polyp with prominent neovascularization, *Fertil. Steril.* 93 (2010) 1324–1326.
- [2] N. Harada, I. Nobuhara, N. Haruta, M. Kajimoto, A placental polyp arising from an exaggerated placental site, *J. Obstet. Gynaecol. Res.* 37 (2011) 1154–1157.
- [3] S. Goyal, A. Goyal, S. Mahajan, S. Sharma, G. Dev, Acquired uterine arteriovenous malformation developing in retained products of conception: a diagnostic dilemma, *J. Obstet. Gynaecol. Res.* 40 (2014) 271–274.
- [4] K. Hiraki, K.N. Khan, M. Kitajima, A. Fujishita, H. Masuzaki, Uterine preservation surgery for placental polyp, *J. Obstet. Gynaecol. Res.* 40 (2014) 89–95.
- [5] J.S. Jimenez, C. Gonzalez, C. Alvarez, L. Munoz, C. Perez, J.L. Munoz, Conservative management of retained trophoblastic tissue and placental polyp with diagnostic ambulatory hysteroscopy, *Eur. J. Obstet. Gynecol. Reprod. Biol.* 145 (2009) 89–92.
- [6] K. Marques, C. Looney, C. Hayslip, L. Gavrilova-Jordan, Modern management of hypervascular placental polypoid mass following spontaneous abortion: a case report and literature review, *Am. J. Obstet. Gynecol.* 205 (2011) e9–11.
- [7] Y. Miyahara, N. Makihara, Y. Yamasaki, Y. Ebina, M. Deguchi, H. Yamada, In vitro fertilization-embryo transfer pregnancy was a risk factor for hemorrhagic shock in women with placental polyp, *Gynecol. Endocrinol.* 30 (2014) 502–504.
- [8] K. Takeuchi, M. Sugimoto, K. Kitao, S. Yoshida, T. Maruo, Pregnancy outcome of uterine arterial embolization followed by selective hysteroscopic removal of a placental polyp, *Acta Obstet. Gynecol. Scand.* 86 (2007) 22–25.
- [9] S.J. Kitson, S. Macphail, J. Bulmer, Is pregnancy safe after uterine artery embolisation? *BJOG* 119 (2012) 519–521.