Diagnosis And Management Of Hypervascular Placental Polypoid Masses (Placental Polyps): A Report Of 4 Cases*

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ABSTRACT

A placental polyp is a polypoid or pedunculated mass or fragment of placental tissue retained in the uterine cavity for an indefinite period of time after abortion or partuition. These retained fragments of placental tissues, especially the hypervascular types, are common causes of vaginal bleeding in the puerperium, or occasionally, months or years after abortion or partuition, and may cause profuse hemorrhage. It is rare with an incidence of < 0.25% of all pregnancies. Despite its rarity, it is potentially life threatening, and high clinical suspicion and prompt and early diagnosis is essential, as well as an accurate diagnosis of neovascularisation to prevent hemorrhagic complications. We present four cases of hypervascular placental polypoid masses wherein thorough history taking and physical examination, in conjunction with serum β-HCG levels and transvaginal ultrasonography with Color Doppler findings led to the prompt diagnosis of this clinical entity. Pelvic ultrasound with Doppler imaging is the most useful initial test for a suspected hypervascular lesion, because it distinguishes tissue with abundant vascularity from that with little or no blood supply. Other useful diagnostic procedures include Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) angiography. Successful conservative management of placental polypoid masses by methotrexate administration, hysteroscopic resection, and uterine artery embolization (UAE) have been reported. Hysterectomy is reserved for patients with intractable vaginal bleeding and patients who are no longer desirous of future pregnancies. Hysteroscopic resection was successfully done in two cases presented, while the other two patients underwent hysterectomy.

Keywords: placental polyp, hypervascular placental polypoid mass, transvaginal ultrasound, color Doppler ultrasonography, uterine artery embolization, hysteroscopic resection, methotrexate

INTRODUCTION

Placental polyp is a rare polypoid or pedunculated mass or fragment of placental tissue retained in the uterine cavity for an indefinite period of time after abortion or partuition. Presented in this paper are four cases of hypervascular placental polypoid masses, each presenting with vaginal bleeding almost immediately after a spontaneous abortion, months after an induced abortion, and five years after a spontaneous vaginal delivery. Thorough and complete history taking, physical examination, in conjunction with serum β-HCG levels and transvaginal ultrasonography with Color Doppler findings led to the prompt diagnosis of this clinical entity. There is no absolute consensus with respect to the diagnosis and management of placental polyps, and an appropriate algorithm has not been established. Successful conservative management of placental polypoid masses was done by hysteroscopic resection in the first two cases, while hysterectomy was done due to intractable vaginal bleeding in the last two cases, who were both no longer desirous of future fertility.

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CASES

Case 1:

R. V. is a 25 year old, G2P1 (1011), who was admitted for profuse vaginal bleeding. Past medical, family, personal, social, and sexual histories were all non-contributory to the case. She had her menarche at 13 years of age, with regular monthly intervals, lasting for three to five days, using three to four sanitary napkins per day. Her last normal menstrual period was last September 12, 2012, approximately three months prior to admission. Her first pregnancy was a spontaneous abortion at 2 months age of gestation, for which she underwent curettage last 2006. Her second pregnancy was a full term livebirth, delivered vaginally at home assisted by a midwife last 2007, with an unremarkable postpartum course.

Three weeks prior to admission, she experienced profuse vaginal bleeding with associated hypogastric pain, using 5 fully-soaked sanitary napkins per day. Her symptoms continued until 11 days prior to admission, she consulted at a local hospital where a pregnancy test was done which was negative, as well as a transvaginal ultrasound which showed a thickened endometrium with retained placental tissues versus hyperplasia. She was advised admission for emergency curettage, however she opted to transfer to our institution due to financial constraints.

On the day of admission, the patient was seen awake and ambulatory, with a blood pressure of 120/80, tachycardic with a heart rate of 104 beats per minute, and a respiratory rate of 18 cycles per minute. She was afebrile. The rest of the systemic physical examination was essentially normal. Speculum examination showed pink and smooth vaginal walls and cervical os, with no lesions nor discharges seen. On internal examination, there was note of normal external genitalia, smooth parous vagina, cervix smooth and closed, corpus was 10 weeks in size, with no adnexal masses or tenderness elicited.

Pertinent laboratory examinations included a negative pregnancy test, a hemoglobin of 132 g/L, hematocrit of 0.321 on complete blood count. Serum β-HCG was low at 6.34 IU/L. Transvaginal ultrasound on admission showed an echogenic endomyometrial mass measuring 1.9 x 3.3 x 1.5 cm with multiple cystic spaces within (Figure 1). The mass seemed to extend to less than 50% of the anterofundal myometrium.

Color flow mapping and Doppler studies of the mass showed moderate peripheral vascularity anteriorly (Figure 2), with low resistance indices (PI = 0.35, RI = 0.29).

The sonographic impression was an endomyometrial mass with the following considerations: (1) Endometrial pathology, malignancy not totally ruled out, (2) Retained products of conception, (3) Gestational trophoblastic neoplasia.

Diagnosis at this time was an endometrial mass consider endometrial pathology versus retained products of conception. She subsequently underwent hysteroscopic guided resection of placental polyp with endometrial curettage under spinal anesthesia. Intraoperatively, there was note of a fleshy polypoid mass attached to a wide base, which is attached to the right anterior midcorpus area measuring 2.0 x 2.0 x 0.5 cm (Figure 3).

Cut section of the fragments of the polypoid mass showed placental-like tissues with no necrotic areas. Patient tolerated the procedure well, with an unremarkable postoperative course. She was discharged well on the second postoperative day.

Histopathologic evaluation showed fragments of chorionic villi on scanning magnification (Figure 4), and mild villous fibrosis, reduced cytotrophoblasts and a relative abundance of syncytiotrophoblasts on low power magnification (Figure 5).

On low power magnification, there are fragments of gestational endometrium (Figure 6), showing an abundance of hyperserrated glands (Figure 7).

Final histopathologic report was decidua and immature placental tissues and hypersecretory endometrium.

Case 2:

J.P. is a 26 year old G5P3 (2122) who was admitted

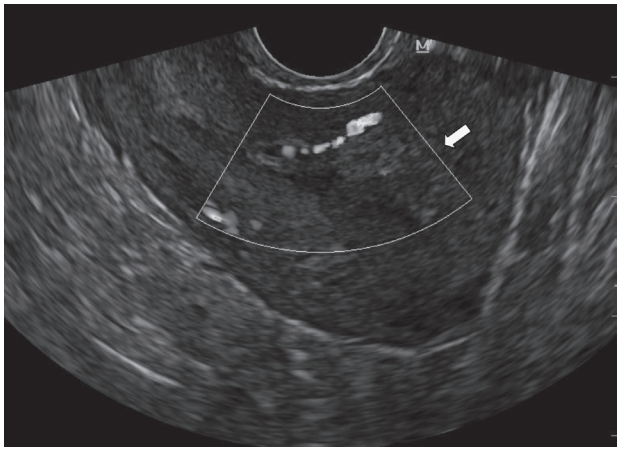

Figure 1. Transvaginal ultrasonography (sagittal view) showing an echogenic mass within the uterine cavity (arrow) with echogenic stipplings, suggestive of calcifications.

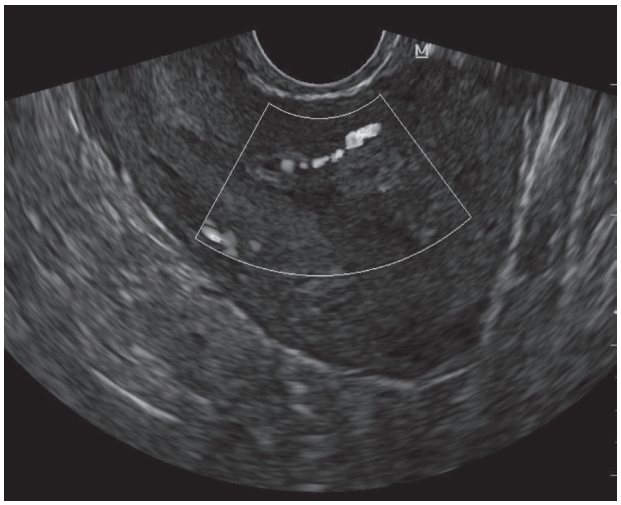

Figure 2. Color Doppler ultrasonography showing moderate peripheral vascularity anteriorly.

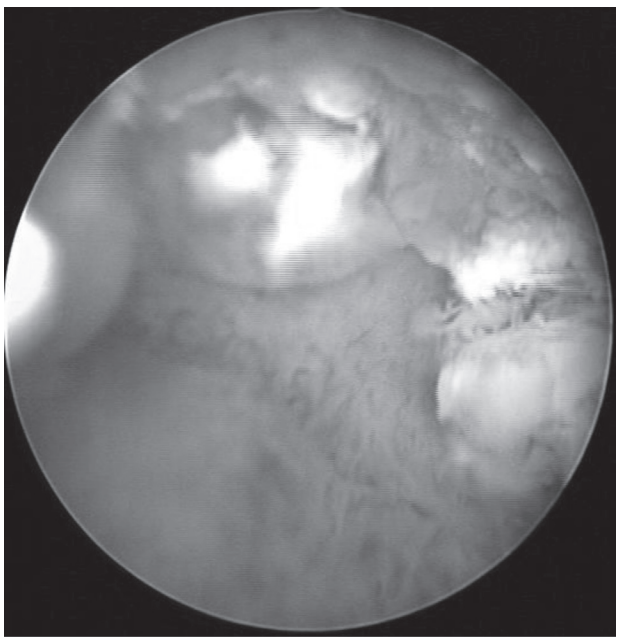

Figure 3. Hysteroscopic view of a polypoid mass attached to a wide base which is attached to the right anterior midcorpus area measuring 2.0 x 2.0 x 0.5 cm.

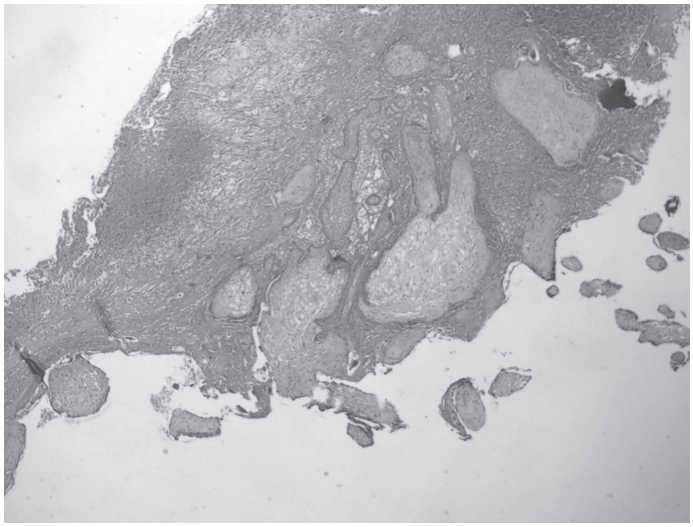

Figure 4. Scanning magnification showing fragments of chorionic villi.

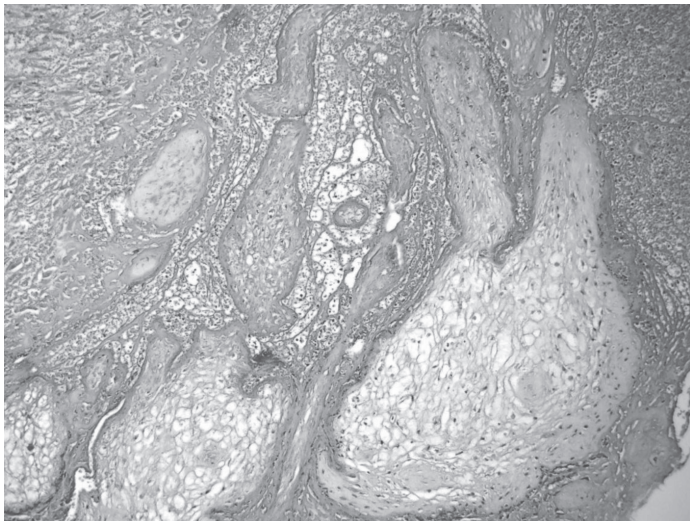

Figure 5. Low power magnification showing mild villous fibrosis, reduced cytotrophoblasts and a relative abundance of syncytiotrophoblasts.

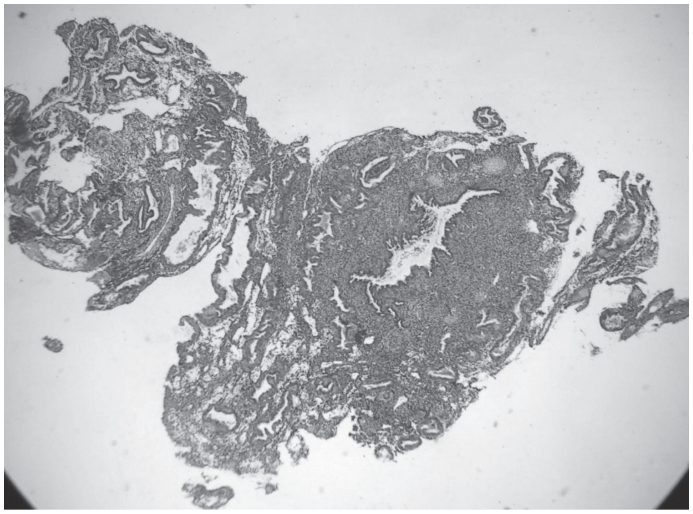

Figure 6. Scanning magnification of endometrial tissues with an abundance of hyperserrated glands.

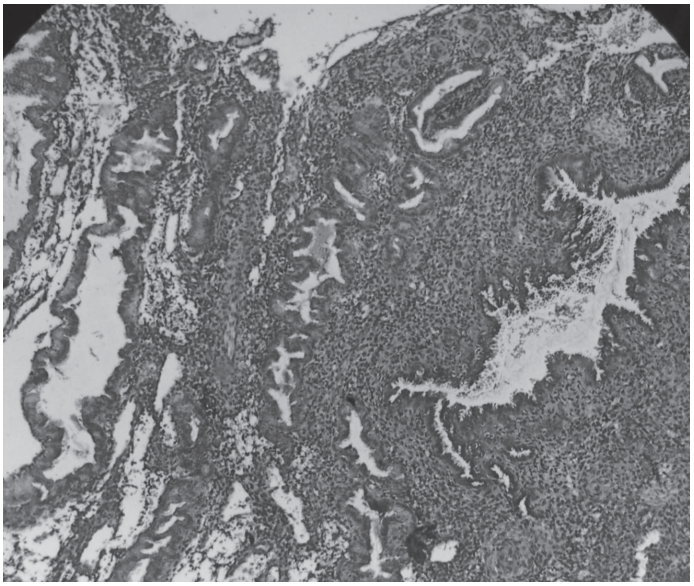

Figure 7. Low power magnification showing a closer view of the hyperserrated glands compatible with gestational endometrium

due to vaginal bleeding. Past medical, family, personal, social, and sexual histories were all non-contributory. She had her menarche at 14 years of age, with regular monthly intervals, lasting for four to five days, using two to three sanitary napkins per day. Her last normal menstrual period was noted six months prior to admission. Her first pregnancy was a spontaneous abortion at three months age of gestation and no curettage was done. Her second and third pregnancies were full term livebirths, delivered vaginally at a local hospital with no fetomaternal complications. On her fourth pregnancy she delivered a preterm livebirth at 6 months age of gestation, however the baby expired after 1 hour due to prematurity.

Three months prior to admission, the patient had two months of amenorrhea and she took a home pregnancy test which was positive. Since it was an unwanted pregnancy, she inserted 2 tablets of Misoprostol 200 ug per vagina, and took 2 tablets of Misoprostol per orem to induce miscarriage. After this, she experienced vaginal bleeding lasting for 4 days using 4 fully soaked sanitary napkins per day. No consults were done and the vaginal bleeding subsequently resolved.

One month prior to admission, there was recurrence of vaginal spotting, now soaking 2 pantyliners per day. She consulted at a local hospital and serum β-HCG was requested and was 33.5 IU/L. A transvaginal ultrasound was done suggestive of molar pregnancy and she was advised to transfer to a tertiary hospital however she did not comply.

Five days prior to admission, the vaginal bleeding increased to 1 fully soaked sanitary napkin per day. Repeat β-HCG showed a decrease to 23.2 IU/L. Persistence of the vaginal bleeding prompted admission.

On admission she was seen awake and ambulatory,

with stable vital signs and essentially normal systemic physical examination findings. Speculum examination showed pink and smooth vaginal walls and cervical os, with no lesions nor discharges seen. On internal examination, there was note of normal external genitalia, smooth parous vagina, cervix smooth and closed, corpus was small, with no adnexal masses or tenderness elicited.

Laboratory examinations showed a negative pregnancy test, and a hemoglobin of 134 g/L, hematocrit of 0.345 on complete blood count. Serum β-HCG was 15.74 IU/L. Transvaginal ultrasound showed an echogenic heterogenous mass measuring 1.7 x 2.1 x 1.6 cm with a vascular pedicle attached posterofundally with no myometrial invasion noted (Figures 8 & 9).

Color flow mapping and power Doppler studies of the mass showed abundant vascularity posterofundally (Figures 10 & 11), with low resistance indices (PI = 0.31, RI = 0.27).

The sonographic impression was an endomyometrial mass consider placental polyp.

She underwent hysteroscopic guided polypectomy and endometrial curettage under spinal anesthesia. Intraoperatively, there was a polypoid mass attached to the posterofundal area of the uterus (Figure 12), which on cut section showed non necrotic placental like tissues with an aggregate volume of 10 cc.

The patient tolerated the procedure well and had an unremarkable post operative course and was discharged well on the second post operative day.

Histopathologic evaluation showed degenerated deciduas and immature placental tissues on scanning magnification (Figure 13).

Fragments of endometrial tissue with hemorrhagic stroma which showed serrated glands are also seen (Figure 14 & 15).

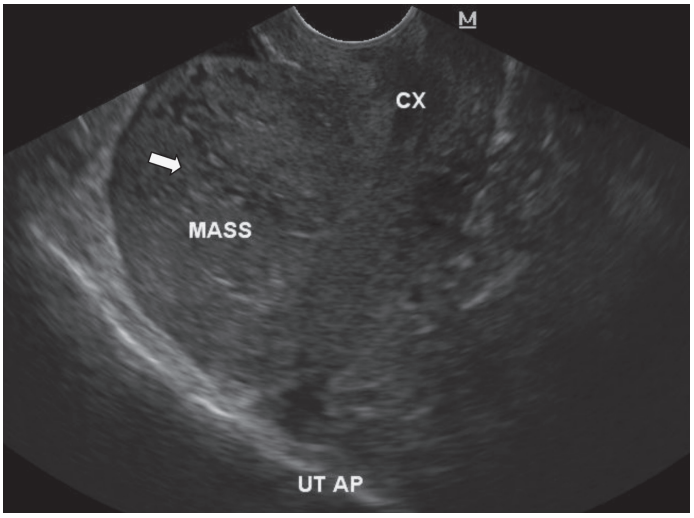

Figure 8. Transvaginal sonography (sagittal view) showing an irregular echogenic heterogenous mass (arrow).

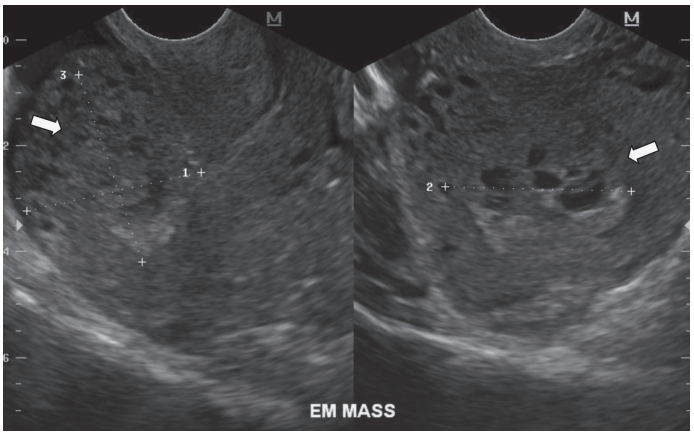

Figure 9. Transvaginal sonography (sagittal and transverse views) showing an irregular echogenic heterogenous mass (arrow).

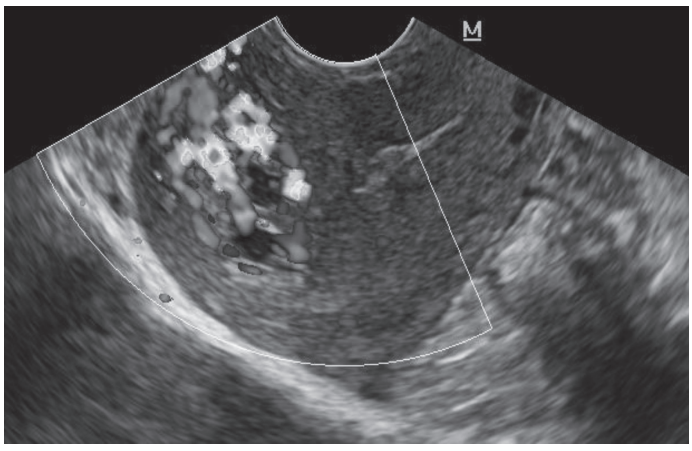

Figure 10. Color flow ultrasonography showing abundant vascularity within the endometrial mass.

Case 3

S.T. is a 41 year old, G6P6 (6006), who was admitted for heavy menstrual bleeding. Past medical, family, personal, social, and sexual histories were all non-contributory. She had her menarche at 13 years of age, with regular monthly intervals, lasting for 2 days, using two sanitary napkins per day. Her last normal menstrual period was two months prior to admission. All her pregnancies were full term livebirths delivered vaginally with no fetometarnal complications. Her last pregnancy was in 2007, which was 5 years prior to admission.

One month prior to admission, she noted increased menstrual flow, soaking 5 sanitary napkins per day. A home pregnancy test was done and was positive. No consults were done and the vaginal bleeding resolved.

Three days prior to admission, the vaginal bleeding recurred with associated passage of meaty tissues per vagina. Persistence of the vaginal bleeding prompted consult.

At the emergency room, she was seen awake and ambulatory, with stable vital signs and essentially normal systemic physical examination findings. Speculum examination showed pink and smooth vaginal walls

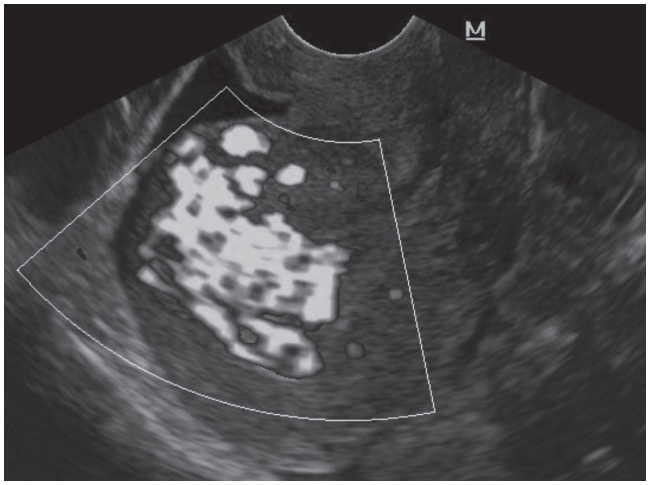

Figure 11. Power Doppler ultrasonography showing prominent vascular flow within the mass.

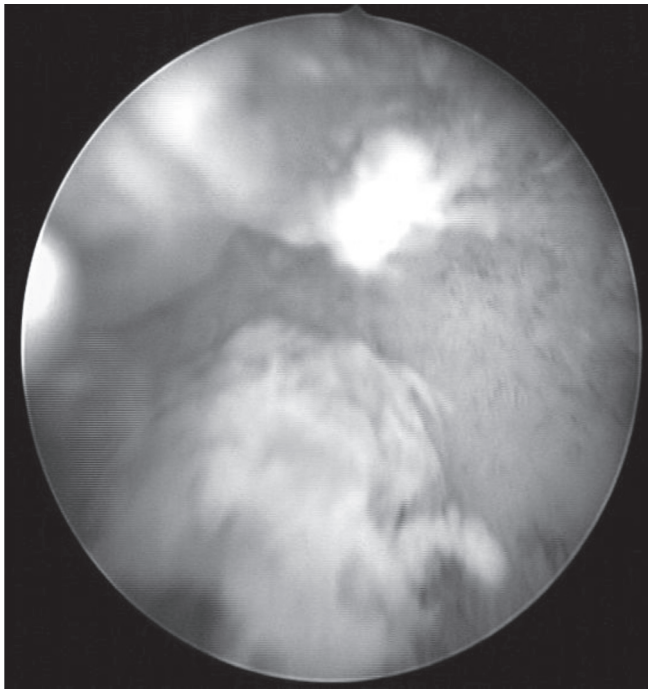

Figure 12. Hysteroscopic view of a polypoid mass attached to the posterofundal area of the uterus.

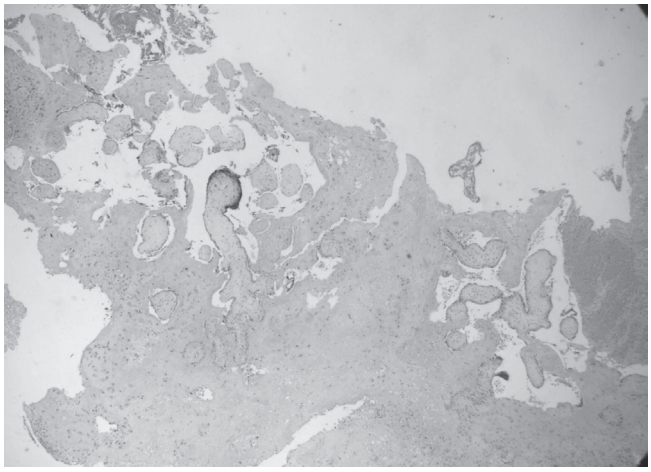

Figure 13. Scanning magnification showing degenerated decidua and immature placental tissues.

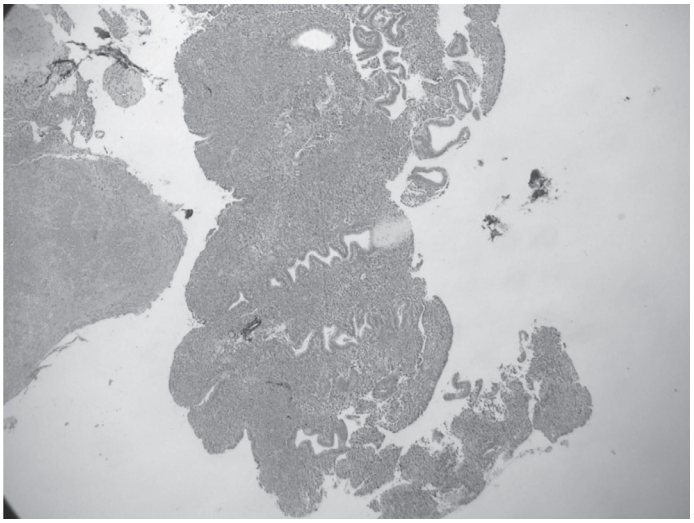

Figure 14. Scanning magnification showing fragments of endometrial tissue with hemorrhagic stroma with serrated glands.

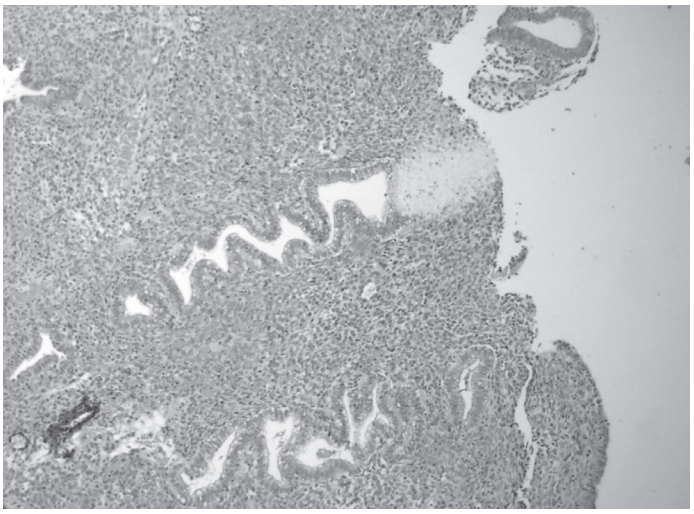

Figure 15. Low power magnification showing fragments of secretory endometrial tissue with hemorrhagic stroma.

and cervical os, with no lesions nor discharges seen. On internal examination, there was note of normal external genitalia, smooth parous vagina, cervix smooth and closed, corpus was 10-12 weeks in size, with no adnexal masses or tenderness.

Laboratory examinations showed a negative pregnancy test, and a hemoglobin of 120 g/L, hematocrit of 0.380 on complete blood count. Serum B-HCG was increased at 72.39 IU/L. Transvaginal ultrasound showed an irregular cystic mass at the anterofundal area of the endometrium measuring 3.4 x 4.5 x 3.6 cm. The mass seems to extend to the posterior midcorpus area of the uterus (Figure 16).

Color flow mapping and Doppler studies of the mass showed abundant vascularity posterofundally, (Figure 17) with low resistance indices (PI = 0.48, RI = 0.46).

The sonographic impression was endomyometrial mass consider arteriovenous malformation versus gestational trophoblastic disease.

The patient however continued to experience profuse vaginal bleeding, this time soaking 1 adult diaper. Repeat hemoglobin decreased to 93 g/L and she had episodes of hypotension with a BP of 80/50-60. Because of this, she was scheduled for emergency hysterectomy.

She underwent total abdominal hysterectomy under epidural converted to general anesthesia. Intraoperatively, there was a polypoid mass attached to the posterior mid-corpus area up to the uterine fundus measuring 5.0 x 4.5 x 2.0 cm (Figure 18), which on cut section showed non necrotic placental like tissues (Figure 19).

Intraoperative blood loss was 500 cc. Postoperatively, she was transfused with 2 units of packed RBCs. The patient tolerated the procedure well.

Repeat hemoglobin after blood transfusion was 108 g/L and she had an unremarkable post operative course and was discharged well on the fourth post operative day.

Histopathologic evaluation showed decidua and degenerated immature placental villi and hemorrhage on scanning magnification (Figure 20), and on low power magnification predominantly showed decidua and areas of hemorrhage (Figure 21).

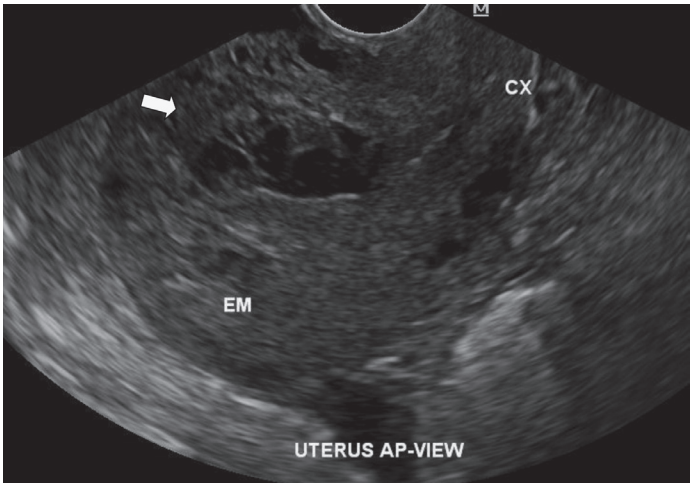

Figure 16. Transvaginal sonography (sagittal view) showing an irregular cystic mass within the endometrial cavity.

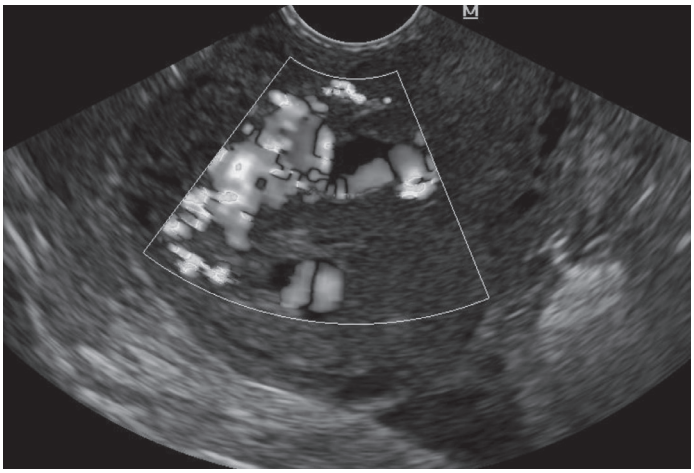

Figure 17. Color Doppler ultrasonography showing abundant prominent vascularity within the mass.

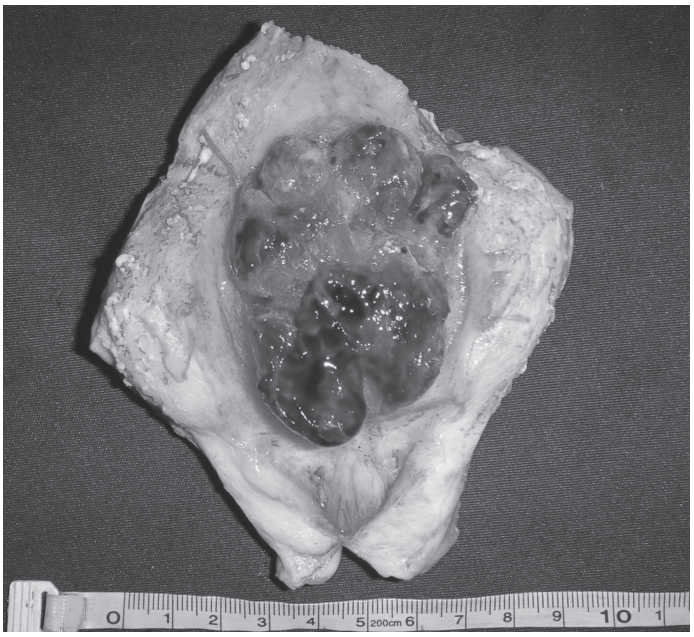

Figure 18. Cut section of the uterus (anterior view) showing a polypoid mass attached to the posterior midcorpus area up to the uterine fundus measuring 5.0 x 4.5 x 2.0 cm.

Figure 19. Cut section of the polypoid mass showing non-necrotic placental like tissues.

These decidual tissues are seen adherent to but not infiltrating the adjacent myometrium (Figure 22).

Final histopathologic report was deciduas and degenerated villi, gestational erndometrium, and chronic endocervicitis.

Case 4:

M. I. is a 42 year old, G11 P8 (8028), who was admitted for vaginal bleeding. Past medical, family, personal,

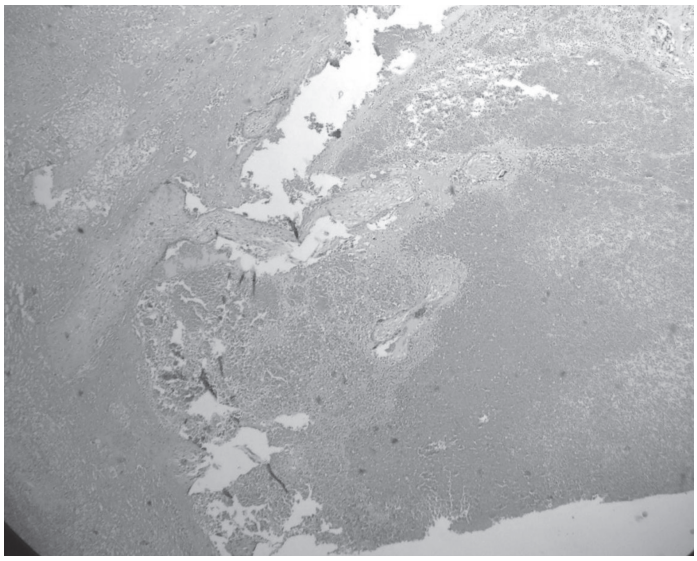

Figure 20. Scanning magnification showing decidua and degenerated immature placental villi and hemorrhage.

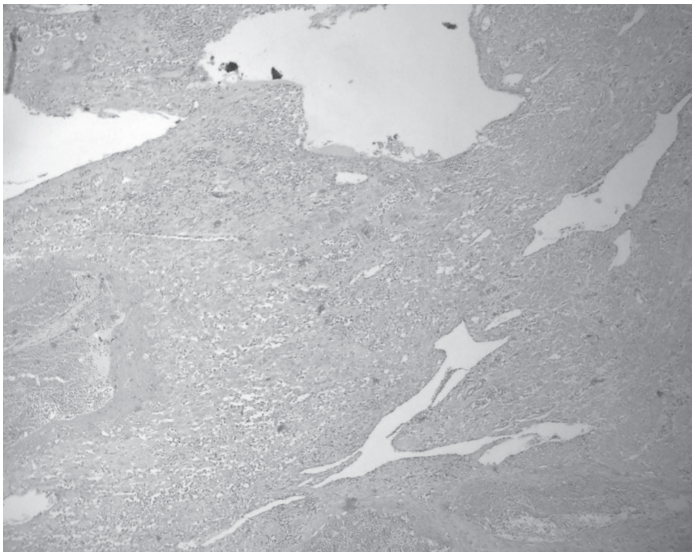

Figure 21. Low power magnification predominantly showing decidua and areas of hemorrhage.

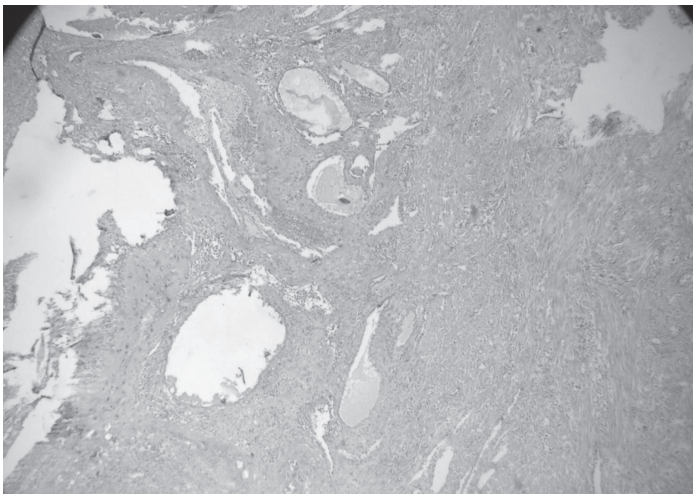

Figure 22. Scanning magnification showing decidual tissues adherent to but not infiltrating the adjacent myometrium.

social, and sexual histories were all non-contributory. Her last normal menstrual period was last October 5, 2012, giving her an amenorrhea of 14 weeks and 5 days. Eight of her pregnancies were full term livebirths delivered vaginally at home by a traditional birth attendant with no fetometarnal complications, and her last pregnancy was last 2003, which was 9 years prior to admission. She had two spontaneous abortions on her 5th and 6th pregnancies, both at 12 weeks age of gestation for which she underwent curettage.

Three months prior to admission, the patient took a home pregnancy test which was positive. Because of this, she took herbal abortifacients and went to a traditional birth attendant and abdominal manipulation was done to induce miscarriage. After this she had intermittent vaginal bleeding with passage of blood clots. No consults were done.

One month prior to admission, the vaginal bleeding increased, this time soaking 5 sanitary napkins per day with passage of meaty material. She consulted a private doctor where a pregnancy test done was positive and transvaginal ultrasound showed gestational trophoblastic disease versus blood clots. Serum β-HCG was elevated at 189 IU/L. She was then referred to our institution for further management.

On admission, she was awake and ambulatory, with stable vital signs and essentially normal systemic physical examination findings. Speculum examination showed pink and smooth vaginal walls and cervical os, with no lesions nor discharges seen. On internal examination, there was note of normal external genitalia, smooth parous vagina, cervix smooth and closed, corpus was 10 weeks in size, with no adnexal masses or tenderness.

Laboratory examinations showed a positive pregnancy test, and a hemoglobin of 126 g/L, hematocrit of 0.367 on complete blood count. Repeat serum β-HCG increased to 209.80 IU/L. Transvaginal ultrasound showed a complex heterogenous mass within the endometrial cavity measuring 4.0 x 2.9 x 2.1 cm which seems to be attached to the anterior midcorpus area by a narrow pedicle measuring 1.2 x 0.9 cm (Figures 23 & 24). There is no myometrial invasion noted.

Color flow mapping and Doppler studies of the mass showed abundant vascularity anteriorly, (Figure 25) with low resistance indices (PI = 0.44, RI = 0.34).

The sonographic impression was endometrial mass consider placental polyp, cannot entirely rule out polypoid gestational trophoblastic neoplasia without myometrial invasion.

Taking all the clinical factors in consideration, such as the age of the patient and that she is no longer desirous of pregnancy, the plan for the patient was hysterectomy.

She underwent total abdominal hysterectomy under spinal anesthesia. Intraoperatively, within the endometrial

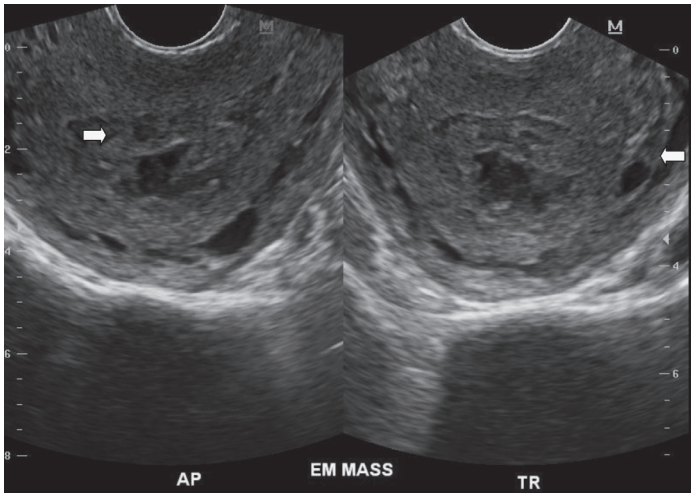

Figure 24. Transvaginal ultrasonography (sagittal and transverse views) showing a complex heterogenous mass within the endometrial cavity, which seems to be attached to the anterior midcorpus (arrows).

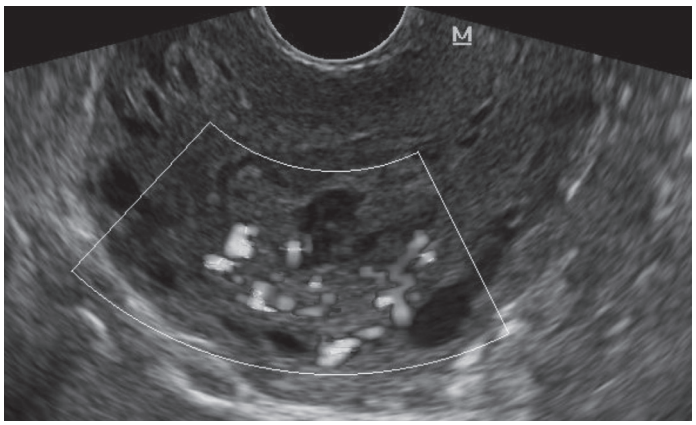

Figure 25. Color Doppler ultrasonography showing prominent abundant vascularity within the endometrial mass.

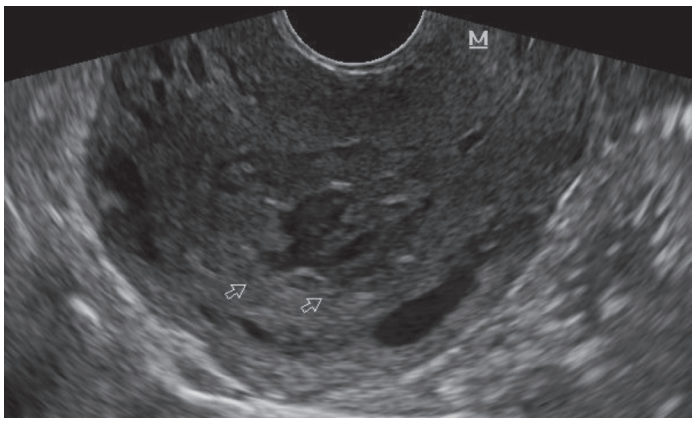

Figure 23. Transvaginal ultrasonography (sagittal view) showing a complex heterogenous mass within the endometrial cavity, which seems to be attached to the anterior midcorpus (arrows).

cavity was a 5.0 x 3.0 x 1.5 cm polypoid mass attached by a 2 cm thick broad based pedicle to the posterolateral corpus, (Figure 26), which on cut section showed placental like tissues with a 2 x 2 cm necrotic area at its base (Figure 27).

Figure 26. Cut section of the uterus (anterior view) showing a polypoid mass within the endometrial cavity attached by a 2 cm thick broad based pedicle to the posterolateral corpus.

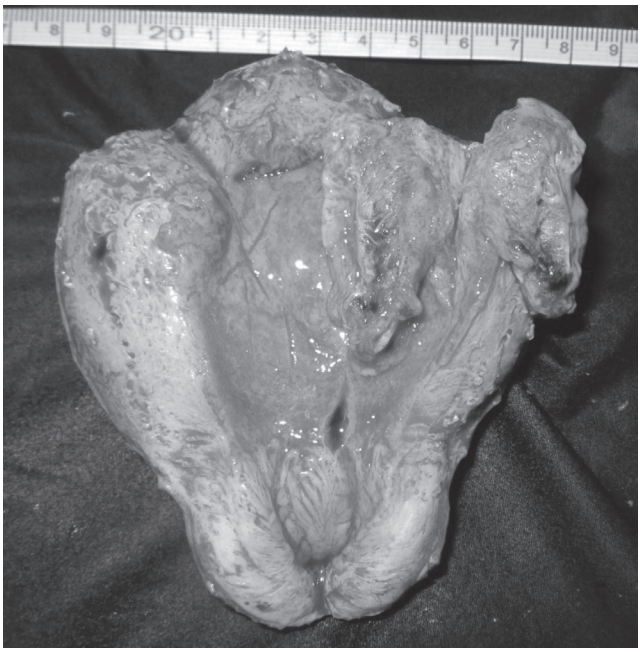

Figure 27. Cut section of the polypoid mass showed placental like tissues with a necrotic area at its base.

Intraoperative blood loss was 500 cc. The patient tolerated the procedure well and she had an unremarkable post operative course and was discharged well on the third post operative day.

Histopathologic evaluation showed degenerated immature placental tissues on scanning magnification (Figure 28).

Scanning magnification also showed that the base

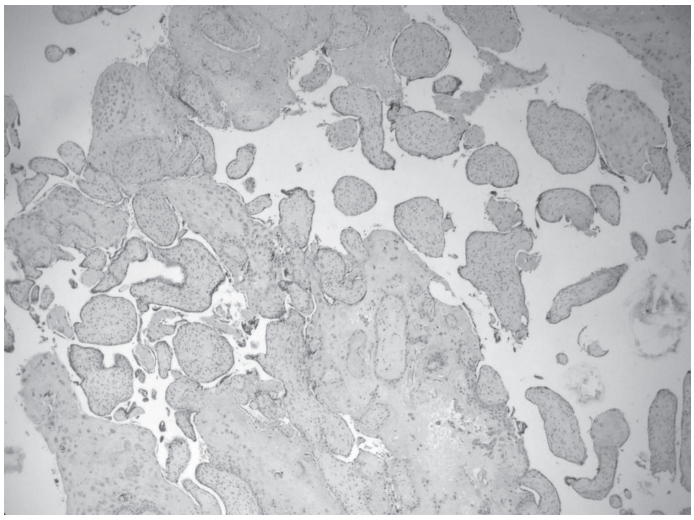

Figure 28. Scanning magnification showing degenerated immature placental tissues.

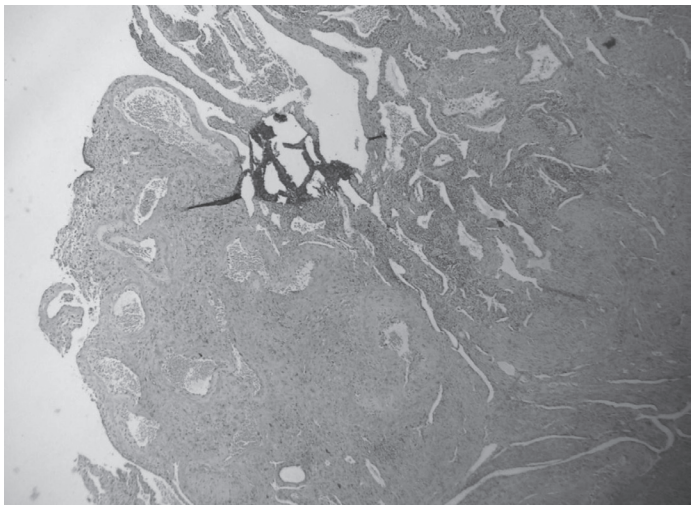

Figure 29. Scanning magnification showing the base of the placental polyp composed mainly of deciduas with prominent large-caliber blood vessels adjacent to proliferative phase endometrium.

of the placental polyp is composed mainly of deciduas with prominent large-caliber blood vessels adjacent to proliferative phase endometrium (Figure 29).

Final histopathologic report was gestational endometrium, immature placental tissues, adenomyosis of the uterine corpus, and chronic cervicitis with nabothian cyst.

DISCUSSION

A placental polyp is a polypoid or pedunculated mass or fragment of placental tissue retained in the uterine cavity for an indefinite period of time after abortion or partuition (1-3). Placental polyps have been recognized since 1884, when Baer reported a case occurring 12 years after pregnancy (4). These retained fragments of placental tissues, most particularly the hypervascular types, are common causes of vaginal bleeding in the puerperium, or occasionally, months or years after abortion or partuition and may cause profuse hemorrhage requiring blood transfusions, interventional radiology procedures, hysteroscopic resection, and even life saving hysterectomy in cases of intractable bleeding.

The incidence of placental polypoid masses is rare, and has been described in literature to be < 0.25% of all pregnancies (5, 6). In the Philippines, there are still no published reports on placental polypoid masses to date. In our institution, which is the largest tertiary referral center in the country, there were only 4 reported cases of placental polypoid masses in the past year, and these four cases are presented in this paper.

A number of case reports of placental polyps have been reported in literature with the interval between the termination of pregnancy to presenting symptoms varying from days to even years in others. Because of this, Dyer and Bradburn have divided placental polyps into acute and chronic types; the former generally encountered within days to weeks following an abortion or term pregnancy, whereas in the latter they are not detected for months and sometimes years (5). For cases 1 and 2, these patients can be classified as chronic types of placental polyps because the vaginal bleeding only occurred 5 years after a full term spontaneous vaginal delivery in case 1, and 3 months after an induced abortion for case 2. For cases 3 and 4, they can be classified under the acute type, because their symptoms presented 3 days after spontaneous abortion in case 3, and 4 weeks after an induced abortion for case 4.

Most commonly, placental polyps occur after therapeutic or induced abortion and spontaneous delivery. This is true for case 1 whose last pregnancy was a spontaneous vaginal delivery, and cases 2 and 4 who had histories of induced abortion. It is extremely rare after a spontaneous abortion and there are only case reports published in literature (4, 7). This was observed in case 3, who was diagnosed with placental polyp almost immediately after a spontaneous first trimester abortion.

Other risk factors for placental polypoid masses identified in literature include mullerian anomalies contributing to abnormal placentation (9), also, a history of placenta accreta combined with uterine atony have been found to contribute to the development of placental polyps (8). Furthermore, Harada, et al in 2011 described a rare case of a placental polyp arising from an exaggerated placental site (10). Watanabe, et al in 2009 reported a case of placental polyp in a patient with neuroblastoma who underwent pelvic irradiation during childhood. In this paper, the authors concluded that uterine irradiation as cancer treatment may predispose a woman to abnormal placentation in a subsequent pregnancy (11). Another recently reported risk

factor is the use of assisted reproductive techniques (ART). A retrospective review by Baba et al in May 2013 found that assisted reproductive technique associated pregnancies have 20 times higher risk of occurrence of placental polyp compared to non ART associated pregnancies, which they theorized to be due to alteration of the endometrial environment and abnormal placental formation, which can cause impaired decidualization and abnormal trophoblast invasion. Moreover, excess exposure to gonodotropin, estrogen and progestin may induce morphological and structural changes and disturb expression of relevant genes in the endometrium (12). However, all the four cases presented in this paper had no histories of mullerian anomalies, abnormal placentation such as placenta accreta, history of exaggerated placental site, history of undergoing pelvic irradiation as cancer treatment, or history of undergoing any assisted reproductive procedure.

Clinical features associated with placental polyps include postpartum hemorrhage and pelvic pain, but in some cases they may be asymptomatic and are detected as an incidental finding on sonography. In a descriptive retrospective study of conservative management of placental polyp by diagnostic ambulatory hysteroscopy by Jimenez, et al in 2009, they reported vaginal bleeding to be the most common reason for referral in 72% of patients, followed by persistence of an asymptomatic placental polyp after expectant management in 15% of patients (9). All four cases in our report presented with varying degrees of vaginal bleeding, from vaginal spotting to profuse vaginal bleeding necessitating emergency hysterectomy such as in case 3.

Furthermore, an understanding of the pathogenesis of placental polypoid masses is essential in the diagnosis and treatment of this clinical entity. This fragment of retained placental tissue undergoes neovascularisation after the resolution of the gestation. Through tissue degeneration with fibrin deposition and inflammatory changes after retention, such fragment of placental tissue forms a placental polyp interlaced with prominent blood vessels. Because of blood infiltration into the tissue, a placental polyp is formed from fibrin deposition and blood clots (10). This would distinguish a placental polyp from a simple placental remnant. A placental polypoid mass is adherent to the endometrium and invades the Nitabuch's layer and incorporates firmly into the myometrium.

There are histologic differences among placental polypoid masses that are based on the precedent pregnancy. Placental polypoid masses after spontaneous vaginal deliveries favor fibrinosis, which was observed in case 1, while masses after abortions contain syncytiotrophoblasts and cytotrophoblasts, as seen in cases 2, 3, and 4. Hypervascularization of placental polypoid masses have been attributed to the syncytiotrophoblast's ability to stimulate neovascularisation in the myometrium. Partially hyalinised and thrombosed vessels cannot contract, which leads to hemorrhage. Additionally, syncytiotrophoblastic activity has a local anticoagulative effect that may further explain the tendency of placental polypoid masses to hemorrhage (5).

Moreover, Milovanov et al in 2008 identified three major types of placental polyps on the basis of histological and immunohistochemical studies: those with 1) preserved villi, 2) clusters of destructive villi, and 3) isolated variable cotyledons. Two pathogenetic mechanisms of uterine hemorrhages have been substantiated: firstly, preservation of the brush border of a syncytiotrophoblast (including the presence of placental phosphatase) maintains the anticoagulative properties of villi; this appears in cases of postabortion hemorrhages and at the most in preserved cotyledons. Secondly, the thromboplastic properties of preserved villi play a leading role in the pathogenesis of uterine hemorrhages where necrotic villi with epithelial remains are prevalent (6).

These histopathologic findings are compatible with and are seen in all the cases presented: fragments of chorionic villi with villous fibrosis in Case 1, degenerated deciduas and immature placental tissues with areas of hemorrhage in Cases 2, 3 and 4.

The most clinically significant placental polypoid mass is the hypervascular type, which was seen in all 4 cases presented. Only 6% of placental polypoid masses are hypervascular and are associated with severe hemorrhage (4). Because of its potentially life-threatening nature, high clinical suspicion and prompt and early diagnosis is essential, as well as an accurate diagnosis of neovascularisation to prevent hemorrhagic complications.

Diagnosing a placental polyp in a woman presenting with postpartum or post abortal bleeding is usually established in concert with clinical, laboratory and imaging findings. Occasionally, however, the diagnosis presents a clinical challenge if the fragment of retained placenta is too small to be clearly identified, or is necrotic with minimal or no production of HCG, as was the case in the first three cases presented who all had low levels of serum β-HCG.

The value of serum β-HCG alone in differentiating placental polyps from other vascular intrauterine conditions may be useful in discriminating these masses from gestational trophoblastic diseases. It is difficult however to distinguish them from other differential diagnoses such as retained products of conception, placenta accreta, or a possible uterine arteriovenous malformation which may all present with a negative pregnancy test and a low serum β-HCG. The determination of the

percentage of free β-HCG subunit may further aid in diagnosing placental polyp and ruling out other vascular conditions. Placental polyp should be suspected in a patient with an elevated serum β-HCG with a normal level of free β-subunit, suggesting the presence of normal chorionic tissue, late in the postpartum period. On the other hand serum free β-subunit to total HCG ratio has been shown to be valuable in discriminating between normal placental tissue and gestational trophoblastic disease (13).

Pelvic ultrasound with Doppler imaging is the most useful initial test for a suspected hypervascular lesion, because it distinguishes tissue with abundant vascularity from that with little or no blood supply. Typical sonographic findings on gray scale ultrasound would show an endometrial mass which may be polypoid, solid, cystic or heterogenous, with multiple scattered variably-sized anechoic areas within. Moreover, power Doppler imaging is useful for examining the site of implantation of an intrauterine polypoid mass, evaluating the blood supply to it, and in planning a conservative approach in removal of the mass (12). Power Doppler can also differentiate tissue with an abundant blood supply from tissue with little or no blood supply such as debris or bloody contents of the uterus. This information is crucial in clinching the diagnosis of placental polyps.

The first case initially presented as a diagnostic dilemma for the attending clinicians. The patient presented with 3 weeks history of profuse vaginal bleeding, and her last pregnancy was noted to be 5 years prior to the admission. Pregnancy test was negative and serum β-HCG was low. Internal examination findings showed the corpus to be 10 weeks in size. Diagnosis at this time was abnormal uterine bleeding rule out an endometrial pathology, since the pregnancy test was negative, serum β-HCG was low, and the corpus size was small on internal examination. Transvaginal ultrasound with power Doppler however showed an echogenic endomyometrial mass measuring 1.9 x 3.3 x 1.5 cm with echogenic stipplings suggestive of calcifications, with moderate peripheral vascularity with low resistance indices. The mass seemed to extend to less than 50% of the anterofundal endometrium. Because of these findings, the sonographic differential diagnoses were the following: 1. an endometrial pathology where malignancy is not entirely ruled out, 2. retained products of conception, or 3. gestational trophoblastic neoplasia. Gestational trophoblastic neoplasia was ruled out in this case due to the low serum β-HCG. A malignant endometrial pathology was not likely in this case due to the age of the patient and on history she had no risk factors for endometrial carcinoma elicited, as well as any constitutional symptoms pointing to a malignancy. The working impression was probable retained products of conception versus a placental polyp. She subsequently underwent hysteroscopy guided polypectomy with endometrial curettage and the intraoperative findings were consistent with a chronic type of placental polyp, which was also confirmed by the histopathologic findings. The echogenicities and calcifications seen on gray scale ultrasound were consistent with the chronic type. Also, what was thought to be myometrial invasion on ultrasound turned out to be just the area of firm myometrial attachment of the placental polypoid mass, and no myometrial invasion was noted intraoperatively and on histopathologic evaluation.

For the second case, the patient presented with vaginal bleeding 1 month after an induced abortion. Pregnancy test was negative, and the serum β-HCG was low and showed a decreasing trend (from a baseline of 33.5 IU/L it decreased to 22 IU/L after 8 days, and further decreased to 15.7 IU/L after 13 days from the baseline). Internal examination showed a small corpus. Transvaginal ultrasound showed an echogenic heterogenous polypoid mass within the endometrial cavity measuring 1.7 x 2.1 x 1.6 cm with a vascular pedicle attached posterofundally. Power Doppler showed abundant vascularity with low resistance indices. Because of the clinical history and decreasing trend of serum β-HCG, in conjunction with the transvaginal and power Doppler findings, the diagnosis was clinched. Clinical diagnosis was an endometrial mass probably a placental polyp. This was confirmed intraoperatively during hysteroscopy guided polypectomy, where a polypoid mass with placental like tissue was seen attached to the posterofundal myometrium, as well as in the histopathologic findings.

The third case also presented as a diagnostic dilemma. The patient presented with heavy menstrual bleeding of 1 month duration following a spontaneous abortion. Pregnancy test was negative, and serum β-HCG was low at 79.4 IU/L. Internal examination showed the corpus was 10-12 weeks in size. Transvaginal ultrasound showed an irregular cystic endomyometrial mass measuring 3.4 x 4.5 x 3.6 cm which extends to the posterior myometrium. Power Doppler showed abundant vascularity with low resistance indices. The sonologic impression was an arteriovenous malformation versus gestational trophoblastic disease. An arteriovenous malformation was considered because of the highly vascular cystic areas seen which on color Doppler showed high velocity and low-resistance indices. These doppler characteristics however may also be present in cases of gestational trophoblastic disease. Gestational trophoblastic disease was deemed unlikely in this case because of the low serum β-HCG. The diagnosis of arteriovenous malformation of the uterus may have been confirmed by pelvic angiography, however this procedure

was no longer comtemplated because of the cost of the procedure and the emergent nature of the case. The profuse vaginal bleeding persisted and the patient underwent emergency hysterectomy. Intraoperatively, the endomyometrial mass turned out to be a hypervascular placental polypoid mass measuring 5.0 x 4.5 x 2.0 cm which on cut section showed placental like tissues. This was also confirmed on histopathologic evaluation.

In the fourth case, the patient presented with vaginal bleeding 1 month after an induced abortion. Pregnancy test was positive and serum b-HCG was elevated at 209 IU/L. Internal examination showed the corpus was 10 weeks in size. Transvaginal ultrasound showed a complex heterogenous endometrial mass measuring 4.0 x 2.9 x 2.1 cm which is attached to the anterior midcorpus. Power Doppler showed abundant vascularity with low resistance indices. The sonologic impression was an endometrial mass consider a placental polyp, cannot entirely rule out polypoid gestational trophoblastic neoplasia without myometrial invasion. Gestational trophoblastic neoplasia was not highly considered in this case, also due to the low serum β-HCG on admission, making the primary diagnosis a placental polyp which was also confirmed intraoperatively and on histopathologic evaluation. For all four cases presented, the level of serum β-HCG and the sonographic and color Doppler findings, in conjunction with thorough history taking and complete physical examination all led the clinicians to suspect a diagnosis of a hypervascular placental polyp.

Although pelvic ultrasound with Color Doppler sonography could provide significant information about the presence of blood flow in a placental polyp tissue, objective information about the size of the vascularised mass and arterial anatomy that supplies blood to the placental polyp tissue could not be obtained without performing a more invasive procedure, such as a computed tomographic (CT) angiography. Takeda et al in 2010 investigated the usefulness of CT anigiography in evaluating the neovascularisation in placental polyp tissue in patients who will undergo a conservative hysteroscopic resection. They found that this procedure provides more detailed information about a vascular intrauterine mass, and it facilitates identification of the size and location of the mass, as well as the laterality of its feeding artery. Findings obtained in this procedure allow selective catheterization of the ipsilateral uterine artery speculated to be the feeder artery (14). This is of use when conservative resection of the placental polyp is contemplated in patients who desire to preserve fertility.

Magnetic resonance imaging (MRI) has been shown in literature to yield similar diagnostic findings as color Doppler ultrasonography, but is less easy to use for rapid diagnosis and is much more expensive. The value of MRI lies in its ability to identify myometrial involvement and it can be used for monitoring reduction in size after expectant management (14). Although both Cases 1 and 2 underwent conservative hysteroscopic resection of the placental polyp, CT angiography and MRI were not done prior to the procedure due to the cost and unavailability of the procedure.

There is still no absolute consensus with respect to the management of placental polyps to date. An appropriate algorithm for the diagnosis and management of placental polyp has not been established due to either the rarity of its occurrence or the infrequency of correct diagnosis. However, with advances in diagnostic and treatment procedures, successful conservative management by chemotherapy, hysteroscopic resection, and uterine artery embolization (UAE), or a combination of these procedures has been reported in literature (15). Hysteroscopic resection of hypervascular placental polypoid masses is an effective alternative to traditional sharp curettage. This technique allows complete extraction with direct visualization of the retained tissue, and has a low rate of complications. Success rates of hysteroscopic resection of placental polyps are high and it approaches 94.8%. Uterine artery embolization on the other hand, has been shown to effectively decrease blood supply and minimizes bleeding if done preoperatively before hysteroscopic resection. However, UAE may increase placenta accreta in future pregnancies and negatively affect ovarian reserve which may affect future fertility. Also, because of the risks of uterine wall ischemia and infection, UAE may not be an ideal option in patients desiring future fertility. Furthermore, chemotherapy with methotrexate administration has shown promise in preoperatively reducing blood supply to the placental polyp prior to hysteroscopic resection. Methotrexate is thought to not only stop cell division but also causes changes in nondividing trophoblastic cells because it is used in cases of placenta previa and abdominal pregnancies. In other words, methotrexate probably diminishes the activity of syncytiotrophoblasts, which is capable of stimulating neovascularisation (12).

The first 2 cases presented benefited from a conservative approach of hysteroscopic resection of placental polyp. This approach was considered because of the patients' age and desire for future fertility. Preoperative uterine artery embolization and methotrexate administration however, were not contemplated in both cases. In cases of intractable vaginal bleeding, hysterectomy can be life saving. It is also an option for patients with completed family size, who no longer desire future fertility. Both patients in cases 3 and 4 have advanced maternal age, with completed family size and

no desire for future pregnancy, and they both underwent hysterectomy.

SUMMARY AND CONCLUSIONS

In summary, we presented four cases of hypervascular placental polypoid masses, each presenting with vaginal bleeding almost immediately after a spontaneous abortion, months after an induced abortion, and five years after a spontaneous vaginal delivery. Thorough and complete history taking, physical examination, in conjunction with serum β-HCG levels and transvaginal ultrasonography with Color Doppler findings led to the prompt diagnosis of this clinical entity. Two patients underwent conservative hysteroscopic resection of the placental polyp, while two patients underwent hysterectomy. Pelvic ultrasound with Doppler imaging is the most useful initial test for a suspected hypervascular lesion, because it distinguishes tissue with abundant vascularity from that with little or no blood supply. Although there is still no consensus regarding the management of hypervascular placental polypoid masses, conservative methods such as methotrexate administration, uterine artery embolization (UAE), and hysteroscopic resection are treatment options. More aggressive procedures such as hysterectomy is reserved for cases of intractable vaginal bleeding and patients no longer desirous of preserving fertility.

Figure 30 shows our proposed diagnostic and therapeutic guideline for a suspected hypervascular placental polypoid mass (See Figure 30).

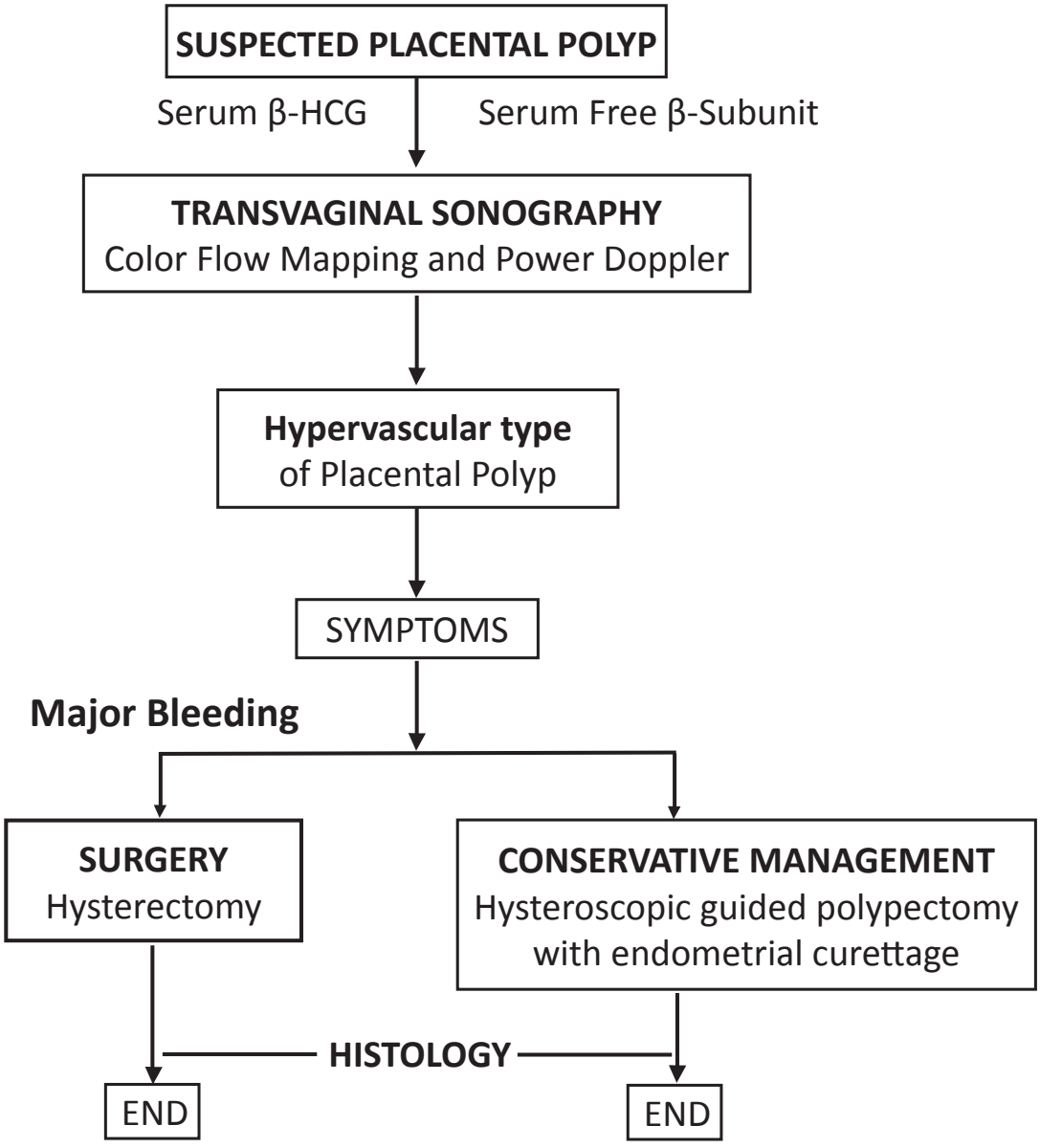

Figure 30. Proposed diagnostic and therapeutic guideline for a suspected placental polyp. *(Adapted from J.S. Jimenez et al. European Journal of Obstetrics & Gynecology and Reproductive Biology 2009. 145:89-92).*

REFERENCES:

1. Swan, RW, Woodruff JD. Retained products of conception, histologic viability of placental polyps. *Obstet Gynecol* 1969;34:506-14.

2. Dyer I, Bradbyrn DM. An inquiry into the etiology of placental polyps. *Am J Obstet Gynecol* 1971;109:858-67.

3. Takeda A, Koyama K, Imoto S, Mori M, Sakai K, Nakamura H. Placental polyp with prominent neovascularisation. *Fertil Steril* 2010; 93:1324-6.

4. Yi J, Choi S, Shin Y, Lee J. Placental polyp: sonographic findings. *AJR* 1993; 161:345-6.

5. Marques K, Looney C, Hayslip C, Gavrilona-Jordan L. Modern management of hypervascular placental polypoid mass following spontaneous abortion: as case report and literature review. *Am J Obstet Gynecol* 2011;9-11.

6. Milavanov AP, Kirsanov IN. The pathogenesis of uterine hemorrhages in the so-called placental polyps. *Arkh Pathol* 2008; 70:34-7.

7. Kaneko M, Harima H, Okagaki R, et al. A case of placental polyp developed immediately after spontaneous abortion. *Nippon Sanka Fujinka Gakkai Zqsshi* 1992;44:255-7.

8. Hoberman LK, Hawkinson JA, Beecham CT. Placental polyps: report of 3 cases. *Obstet Gynecol* 1963;22:25-9.

9. Jimenez J, Gonzalez C, Alvarez A, Munoz L, Perez C, Munoz J. Conservative management of retained trophoblastic tissue and placental polyp with diagnostic ambulatory hysteroscopy. *Eur J Obstet Gynecol Reprod Biol* 2009;145:89-92.

10. Harada N, Nobuhara I, Haruta N, Kajimoto M. A placental polyp arising from an exaggerated placental site. *J Obstet Gynecol Res* 2011; 37:8;1154-7.

11. Watanabe N, Tsutsui J, Kakiuchi S, Chik Jwa S, Takahashi H, Kato N, et al. Intra-abdominal bleeding during pregnancy, preterm delivery, and placental polyp in a long term survivor of neuroblastoma: a case report. Obstetrics and Gynecology International 2009; Article ID 564567, 3 pages.

12. Baba T, Endo T, Ikeda K, et al. Assisted reproductive technique increase the risk of placental polyp. *Gynecol Endocrinol* 2013;29(6):611-4.

13. Kanaoka Y, Maeda T, Nakai Y, Imanaka M, Ogita S. Placental polyp: power Doppler imaging and conservative resection. *Ultrasound Obstet Gynecol* 1998;11:225-7.

14. Kurachi H, Maeda T, Murakami T, Tsuda K, Sakata M, Nakamura H, et al. MRI of placental polyps. *J Comput Assist Tomogr.* 1995;19(3):444-8.

15. Takeda A, Koyama K, Imoto S, Mori M, Sakai K, Nakamura H. Computed tomographic angiography in diagnosis and management of placental polyp with neovascularisation. *Arch Gynecol Obstet* 2010;281:823-8.

16. Hatada Y. An unexpected case of placental polyp with villi devoid of cytotrophoblastic cells. *J Obstet Gynecol*. 2004;2:193-4.

17. Callen P. Ultrasonography in obstetrics and gynecology. 5th ed. Philadelphia: Elsevier Inc 2008.