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CASE REPORT

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The role of multidisciplinary team and stepwise pelvic devascularization to minimize blood loss during total pelvic exenteration for patients refusing blood transfusion

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Key Clinical Message

Radical gynecology oncology surgeries are feasible in patients refusing blood transfusion, when performed with careful preoperative (with hemoglobin optimization and patients' counseling), intraoperative (with hemostasis and stepwise devascularization, hemodilution, and autologous cell salvage) and postoperative (considering iron infusion or erythropoietin) planning with a multidisciplinary team involvement.

Abstract

We describe the case of a female Jehovah's Witness patient in her 60s undergoing pelvic exenteration, focusing on the preoperative, intraoperative, and postoperative measures that allowed an uncomplicated surgery without blood transfusion. Blood transfusions are common in the surgical management of gynecology oncology patients, up to 93% of patients undergoing pelvic exenteration may require blood products. However, increasingly more patients are cautious in receiving blood products, either for fear of potential risks or for religious believes. It is therefore vital to optimize the management of these patients in order to avoid blood transfusions. In this case, we summarize the management of a lady in her 60s who underwent laparotomy, pelvic exenteration, Bricker colicureterostomy, and end colostomy formation for recurrent endometrial carcinoma, despite previous total abdominal hysterectomy and bilateral salpingo-oophorectomy followed by brachytherapy, chemotherapy, and external beam radiotherapy for high-grade serous carcinoma. Preoperatively, an advance decision to refuse blood products was discussed to ascertain all the options that were suitable. As her preoperative hemoglobin was acceptable (127 g/L), no further intervention was required. Intraoperatively, blood loss was effectively minimized with meticulous hemostasis, stepwise pelvic devascularization, intraoperative hemodilution, and cell salvage. Despite these interventions, total blood loss was 1030 mL and postoperative hemoglobin was 113 g/L. Postoperative measures therefore included intravenous

iron infusion, minimization of phlebotomy, and optimization of cardiopulmonary status. Erythropoietin was also considered, but was not necessary as patient responded to the previous measures well and was successfully discharged after an uncomplicated recovery. Only few cases of total pelvic exenteration have been described in the literature for Jehovah's Witness patients. However, our case shows that laparotomy and pelvic exenteration is feasible in patients refusing blood products, if performed under a multidisciplinary team and with careful preoperative, intraoperative, and postoperative planning, also in the setting of previous radical hysterectomy and co-adjuvant therapy.

KEYWORDS

blood transfusion, case report, endometrial adenocarcinoma, multidisciplinary, pelvic exenteration

1 | BACKGROUND

Total pelvic exenteration (TPE) was firstly introduced in 1948 by Brunschwig and it has been described as "the most radical surgery so far described for pelvic cancer".[1] For this reason, it carries high risk of complications, and up to 93% of patients undergoing TPE will require blood transfusion.[2]

Therefore, very few cases of pelvic exenteration have been described in patients refusing blood transfusion. We describe a case of a female Jehovah's Witness patient in her 60s who underwent total pelvic exenteration for recurrent endometrial carcinoma, focusing on the preoperative, intraoperative, and postoperative measures that allowed an uncomplicated surgery without blood transfusion.

2 | CASE PRESENTATION

We report the case of a lady in her 60s that was referred to our hospital for further management of a third relapse of endometrial carcinoma. This patient was initially diagnosed with Grade 3, Stage 1A mixed serous, and endometrioid endometrial adenocarcinoma 4 years ago and was initially managed with total abdominal hysterectomy, bilateral salpingo-oophorectomy and bilateral pelvic lymphadenectomy, followed by 3 cycles of brachytherapy. She then experienced a first relapse 2 years after the first procedure, which required surgical excision and chemotherapy, allowing for a complete resolution. Unfortunately, a second relapse then occurred 1 year later, affecting the left pelvic side wall; this required further chemotherapy and external beam radiotherapy. Finally, a third relapse was then diagnosed 1 year later, with a PET CT that showed an isolated 25 × 30 × 30 mm mass again affecting the left pelvic side wall.

FIGURE 1 CT urogram showing involvement of left ureter.

3 | INVESTIGATIONS

Preoperative workup included,

1. computed tomography urogram, which did not show any bladder involvement, but identified that the left ureter was running anteriorly across the mass (Figure 1, *CT urogram*);
2. MRI pelvis which showed that the mass was abutting, but not invading, the rectum;
3. diagnostic laparoscopy and cystoscopy, which identified a 3 cm mass in the left pelvic side wall below the level of the iliac vasculature, which was completely adherent to the left ureter, but there was no evidence of disease in the rectum or bladder.

4 | TREATMENT

After careful discussion in our multidisciplinary team meeting, which initially included members from the gynecology, histopathology, and radiology departments, as well as, on a later stage, consultants from the urology and colorectal teams, the decision was for supralevator anterior pelvic exenteration ± posterior pelvic exenteration. As the patient was refusing blood transfusion due to religious belief, careful operative planning was vital. Previous case reports[3] had proven the effectiveness of a multidisciplinary approach when performing complex pelvic surgeries and therefore good communication between the teams was vital to organize a joint procedure.

Preoperative measures included appropriate advance decision counseling in order to explore all the suitable alternatives, as well as optimization of hemoglobin level with iron supplementation.

Laparotomy was performed in Lloyd Davies position[4] and showed a 4–5 cm mass arising from the left vaginal vault, completely attached to the posterior wall of the bladder and to the left ureter, as well as adherent and invading the serosal surface of the rectum and the sigmoid colon (*Specimen*: Figures 2 and 3). Preservation of the bladder and of the bowel was not feasible, and therefore the patient underwent a total pelvic exenteration, with Low Hartmann's operation, radical cystectomy, Bricker colicureterostomy (colonic conduit), stomas formation in left iliac fossa for diversion and cystoscopic insertion of ureteric stents.

The procedure started with a cystoscopy, which again confirmed that the mass was denting the posterior wall of the bladder, and insertion of a left ureteric stent. Midline laparotomy was then performed with surgical steps based on the principles of the Soleymani–Alazzam–Collins technique,[5] which was developed in our department and, as such, was familiar to the operating surgeons. This technique minimizes the blood loss by de-vascularizing the pelvis prior to the exenteration. After achieving adequate surgical access, opening the pelvic sidewall and achieving retroperitoneal access, both the right and left common iliac arteries were slung and the anterior division of the internal iliac artery bilaterally was tied to achieve de-vascularization similar to radiological embolization. The colorectal and urology teams then joined to continue with successful radical cystectomy and posterior exenteration with the en bloc removal of the mass, upper part of the vagina, bladder, and rectosigmoid colon.

Intraoperative measures to reduce blood loss included: meticulous hemostasis with stepwise pelvic devascularization, intraoperative hemodilution (patient received 7 L of compound sodium lactate solution intraoperatively), tranexamic acid, and vitamin K, as well as autologous blood salvage (which has been shown to be safe in gynecological oncology patients[6]) which allowed 252 mLs of transfusion on a total blood loss of 1030 mLs.

The patient was then transferred to ITU where she was initially treated with noradrenaline. She also received IV Ferinject and was successfully discharged home without complications after 10 days, with a postoperative hemoglobin of 113 g/L.

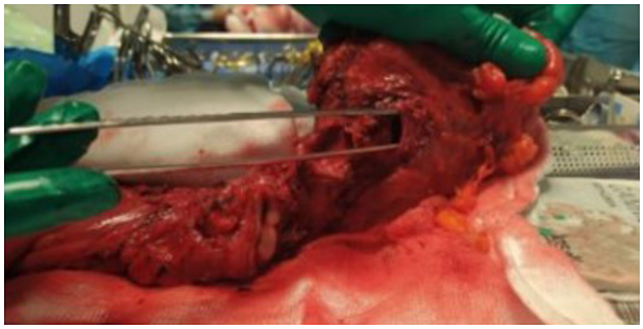

FIGURE 3 Specimen from another perspective, requiring radical cystectomy.

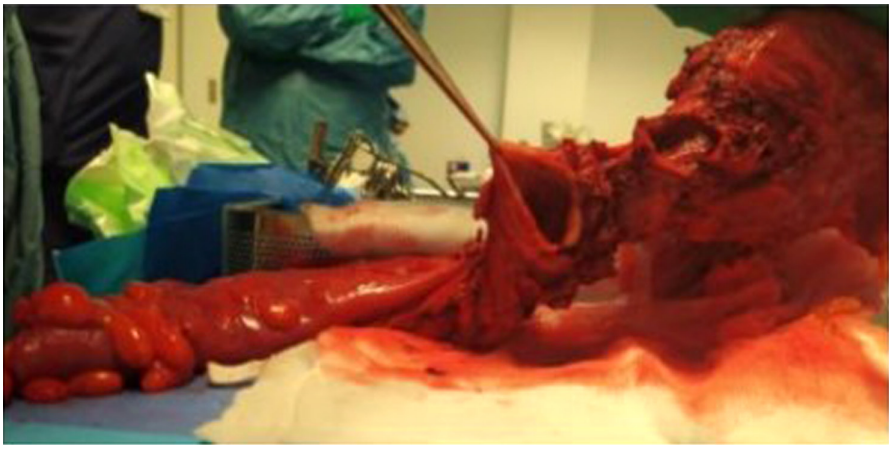

FIGURE 2 Specimen with serosal invasion of the rectum requiring bowel resection.

5 | OUTCOME

The histology from the surgery showed complete en bloc resection of the tumor with clear surgical margin; rectosigmoid, bladder, and distal ureter were all clear of metastasis.

She made an excellent recovery and was successfully discharged to her local hospital without concerns.

She is currently free of relapse and is being followed up by her local hospital.

6 | DISCUSSION

This case report demonstrates the effectiveness of alternative interventions in bloodless surgery, showing that radical and extensive gynecological oncology surgeries can be feasible in patients refusing blood transfusions if careful preoperative, intraoperative, and postoperative measures are applied. Surely, increasingly more patients are cautious in receiving blood products, either for fear of potential risks or for religious believes.[7] It is therefore vital to optimize the management of these patients in order to avoid blood transfusions.

Performing complex pelvic surgery in similar contexts surely raise ethical dilemmas and gynecology-–oncology surgeons always need to acknowledge the ethical principles[8] of beneficence, non maleficence, autonomy, and justice. In this case, the patient surely benefited from this surgery as a treatment option for the relapse of the endometrial cancer (beneficence), which was carefully planned to minimize the risks and the blood loss (non maleficence). As she was clear that she would have refused blood products in any circumstances due to her religious beliefs, she was extensively counseled in order to agree any plans in case of torrential bleeding, in order to work out any alternatives that were acceptable to the patient and to respect the principle of autonomy.

In conclusion, only few cases of total pelvic exenteration have been described in the literature for Jehovah's Witness patients. However, our case shows that laparotomy and pelvic exenteration is feasible in patients refusing blood products, if performed under a multidisciplinary team and with careful preoperative, intraoperative, and postoperative planning, also in the setting of previous radical hysterectomy and co-adjuvant therapy.

7 | LEARNING POINTS

This case outlines the basic principles of bloodless surgery which include,

1. Preoperative measures:

(i) careful patient selection, which includes clinical assessment, patient's willingness, and compliance with the treatment and extensive counseling; advance directives need to be explored with the patient, in order to clarify the acceptable alternatives;
(ii) adequate preoperative workup in order to plan the procedure meticulously: this includes not only multiple image modalities (if required), but also further diagnostic surgeries such as laparoscopy and cystoscopy;
(iii) multidisciplinary team involvement;
(iv) hemoglobin optimization (with iron/folic acid/vitamin B12 supplementation if applicable).

2. Intraoperative measures:

(i) meticulous hemostasis and skilled surgical techniques by the most experienced surgeon available;
(ii) limiting operative time as much as possible;
(iii) intraoperative hemodilution with intravenous fluids;
(iv) pharmacological hemostatic agents (such as tranexamic acid, vitamin K);
(v) perioperative autologous cell salvage, which has been shown to be safe in gynecological oncology patients.

3. Postoperative measures:

(i) optimization of cardiopulmonary status (with admission to ITU if required);
(ii) limiting blood sampling;
(iii) intravenous Ferinject if needed;
(iv) use of erythropoietin can also be considered, if acceptable to the patient.

AUTHOR CONTRIBUTIONS

Valentina Le Thanh: Writing – original draft. **Richard Bell:** Methodology. **Nicholas Symons:** Methodology. **Hooman Soleymani Majd:** Conceptualization; methodology; supervision; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

All authors declare that they have no conflicts of interest.

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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