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CASE REPORT

Pregnancy in a Jehovah's Witness with Cervical Cancer and Anemia

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A 34-year-old Jehovah's Witness presented with vaginal bleeding and anemia at 23 weeks gestation. She was diagnosed with a FIGO Stage IB_2 squamous cell carcinoma of the cervix. The patient refused transfusion of blood products and strongly desired to continue the pregnancy. She was hospitalized and at 33 weeks gestation underwent a Cesarean–radical hysterectomy with measures that minimized blood loss.

INTRODUCTION

The Jehovah's Witness religious community was founded in 1884 in Pennsylvania [1]. Although blood transfusion had been a part of medical practice since the 19th century, it was not until July 1945 that the taking of blood into the human body was doctrinally proscribed in *The Watchtower*, the official publication of the Jehovah's Witnesses [2, 3]. According to the religious beliefs of Jehovah's Witnesses, blood transfusions are prohibited on penalty of loss of eternal life in God's kingdom. This refusal is based on a literal interpretation of a passage from the Bible: "For the life of the flesh is in the blood … no soul of you shall eat blood, neither shall any stranger that sojourneth among you eat blood" (Lev. 17:11).

CASE HISTORY

A 34-year-old, Mexican national, gravida 6, para 5 presented to the University of California, Irvine–Medical Center at 23 weeks gestation with vaginal bleeding from a bulky, friable, 4.5×4 cm, anterior cervical lesion. Biopsy confirmed the clinical impression of a FIGO Stage IB_2 invasive squamous cell carcinoma.

The bleeding resolved following the application of local hemostatic agents. Laboratory studies were remarkable only for severe iron-deficient anemia (hemoglobin, 6.4 g/dl; hematocrit, 19.4%). The patient was a Jehovah's Witness and adamantly stated that she would not accept blood transfusions under any circumstances. In addition, she expressed a strong desire to continue the pregnancy.

A medical ethics committee meeting was convened and included members from the divisions of gynecologic oncology, maternal–fetal medicine, neonatology, and the department of anesthesiology. A hospital social worker, a member from the risk management office, three labor and delivery nurses, the hospital chaplain, two representatives from the community, and university legal counsel were also present. The patient, her husband, and their 16-year-old daughter were in attendance at the invitation of the patient care team. The Minister and Chairman of the Los Angeles/Orange County Hospital Liaison for Jehovah's Witnesses was present at the request of the patient.

Medical management strategies were outlined as follows:

1. *Pregnancy.* The patient continued to have intermittent bleeding episodes and was to be hospitalized on bedrest. A plan was designed to affect delivery when fetal pulmonary maturity was documented.
2. *Anemia.* Although the patient refused to accept a blood transfusion, she was willing to accept volume expanders such as hespan and the use of a cell saver, intraoperatively. Because of the theoretical risks of hematogenous dissemination of tumor cells and amniotic fluid embolism, the cell saver would be made available but used only if absolutely necessary. During her hospitalization, she was scheduled to receive human recombinant erythropoietin three times weekly and ferrous sulfate, folic acid, and vitamins B_{12} and C orally on a daily basis.
3. *Cervical cancer.* Due to the increased risk of hemorrhage, a vaginal delivery was felt to be contraindicated. Delivery by Cesarean–radical hysterectomy was planned if the hemoglobin reached 10 g/dl with demonstrated fetal lung maturity. If the patient's anemia precluded safe performance of this procedure, a classical Cesarean section would be followed by postpartum treatment. The administration of neoadjuvant chemotherapy in an attempt to control the malignant disease process during the period of gestational advancement was precluded on the basis of potential bone marrow toxicity and worsening of anemia.

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To compound the clinical decision making, the patient was an illegal alien, which, in the State of California, only permits insurance coverage for medical services which are necessary during the antenatal and intrapartum periods. Thus, she was not eligible to receive funding either for radiotherapy or surgery following delivery, and as such, faced a high probability of being denied hospitalization at local medical facilities for either of these two treatment options postpartum.

At 27 weeks gestation, preterm uterine contractions with vaginal bleeding were treated with intravenous magnesium sulfate. Intravenous corticosteroids were administered to accelerate fetal pulmonary maturity. Interval sonographic studies revealed appropriate fetal growth. At 31 weeks gestation, the patient experienced preterm premature rupture of the membranes. In an attempt to prolong the latency period and decrease the risk of chorioamnionitis, she received intravenous Unasyn, followed by oral Augmentin [4].

At 33 weeks gestation, the patient developed increased uterine activity. Her hematocrit had risen to 30.8%. A multidisciplinary meeting was held. The risk-versus-benefit discussion was felt to justify delivery of the baby under controlled measures. Three possible treatment strategems regarding the management of the patient's cervical cancer were readdressed:

A. Cesarean–radical hysterectomy and bilateral pelvic lymphadenectomy.

B. Cesarean section with postpartum radiotherapy or surgical treatment.

Option B was associated with the uncertainties discussed previously. Accordingly, the decision reached between the patient and the patient care team was to perform definitive surgical therapy at the time of delivery.

The patient underwent a classical Cesarean section through a midline skin incision under epidural analgesia. Once the peritoneum was entered, intravenous oxytocin was administered. A sterilely contained 4-mHz ultrasound transducer was placed in direct contact with the uterus to delineate the margins of the anterior placenta for guidance of the uterine incision. A female infant, weighing 2128 g with Apgar scores of 8 and 9, was delivered. The placenta was manually extracted and the uterine incision was immediately reapproximated with sharp towel clamps. O-Maxon looped surgical ligature was then used to close the hysterotomy as the clamps were removed in succession. A Wertheim radical hysterectomy, bilateral pelvic lymphadenectomy, bilateral ovarian transposition to the pericolonic gutters, and suprapubic catheter placement was performed without complications under general anesthesia. Blood loss was minimized in part by use of the endo-GIA stapling device which was employed on each cardinal ligament and uterosacral ligament. The tumor appeared to be confined to the cervix without evidence of direct extension, pelvic or periaortic lymphadenopathy, or other suspicious findings. The estimated blood loss of the Cesarean–radical hysterectomy and bilateral pelvic lymphadenectomy was 1000 cc. A cell saver had been available intraoperatively but was not employed.

The patient had an unremarkable postoperative course. Her hematocrit was 24.5% on the day after surgery. She was discharged on the eighth postoperative day with ferrous sulfate. The baby did well in the nursery and was taken home by her parents on the 15th day of life.

The final pathology revealed complete circumferential cervical involvement of a moderately differentiated squamous cell carcinoma with a horizontal extension of 5.0 cm and a depth of invasion of 3.7 cm. The tumor involved a portion of the lower uterine segment, but the surgical margins and the vaginal cuff were free of disease. Lymphovascular and perineural invasion was identified. The endometrium, myometrium, 17 pelvic lymph nodes, and the placenta were without evidence of metastases.

DISCUSSION

While many health care professionals may be philosophically opposed to Witnesses' decisions to refuse blood transfusions in critical medical situations, pregnancy creates additional dilemmas with respect to the need to advocate for the health and welfare of the fetus. The potential viability of the fetus made this case a legal, ethical, and medical conundrum. The United States Supreme Court in Prince v Commonwealth of Massachusetts ruled that "Parents may be free to become martyrs themselves, but it does not follow that they are free, in identical circumstances, to make martyrs of their children" [5]. In our particular case, some members of the medical ethics committee suggested obtaining a court order to transfuse the patient for the benefit of the fetus. They reasoned that from an ethical viewpoint, obtaining a court order to forcibly transfuse an unwilling patient constituted paternalism and not coercion. However, the possible benefits to the fetus of a maternal transfusion were uncertain and other committee members expressed the opinion that the theoretical risks to the fetus did not warrant demanding transfusion of the patient or seeking a court opinion.

Medical decision-making was also impacted by our patient's religious beliefs. Treatment strategies needed to encompass both surgical principles and cancer treatment. Gynecologic surgery may be performed safely in Jehovah's Witnesses. Bonakdar and colleagues reviewed their experience with 165 Jehovah's Witnesses who underwent major obstetrics and gynecologic surgery [6]. They did not find any statistically significant differences in postoperative hemoglobin levels, morbidity, and mortality when the Jehovah's Witnesses' group were compared to 164 control women undergoing similar procedures.

Experience in the management of anemia in cancer patients who are Jehovah's Witnesses is limited. Two reports describe a positive impact that human recombinant erythropoietin had on two Jehovah's Witnesses, one prior to surgery for colon

cancer [7] and the other prior to chemotherapy for acute leukemia during pregnancy [8]. Additionally, a report from Switzerland described the postoperative use of human recombinant erythropoietin in a Jehovah's Witness with cervical cancer who sustained a 3000-mL blood loss at the time of tumor resection [9].

The pregnant state imposed additional restrictions with respect to timing of cancer therapy. A limited treatment delay to await fetal maturity for pregnancies complicated by FIGO Stage I squamous cell carcinomas is considered acceptable. Based on the existing medical literature, such deliberate delays are not believed to impact negatively on maternal survival [10].

Despite the well-known increased blood loss associated with a classical Cesarean section, in an attempt to preserve the lower uterine segment, a vertical uterine incision was advised. Reasons cited for not incising the lower uterine segment included: (i) improved pathologic analysis of the radical hysterectomy specimen and (ii) avoidance of both increased bleeding and the theoretical risk of increased tumor dissemination should disease be present in the lower uterine segment.

Ideally, physicians should not have their medical management decisions predicated by the socioeconomic circumstances surrounding their patients. However, the decision to proceed with surgical treatment of her cancer was based on the patient's strong desire to avoid radiotherapy and the probability that she would not be eligible to receive this modality postpartum given her alien resident status.

The ability to stimulate erythropoiesis antenatally and the intraoperative techniques described above permitted surgery to be performed without excessive blood loss. The management strategies employed in the care of this patient were consistent with the goal to respect her religious beliefs and the need to treat her cancer effectively while maximizing her safety and that of the fetus.

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