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LITERATURE REVIEW

Preserving Pregnancy in Face of Cervical Cancer: Favorable Fetal and Maternal Outcomes – An Evidence Based Case Report

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Abstract

Background: *Cervical cancer diagnosed during pregnancy poses a complex clinical and ethical dilemma, requiring a balance between timely maternal cancer treatment and fetal preservation. Recent studies show that pregnancy itself does not worsen long-term cancer outcomes, allowing for a more individualized approach especially in early-stage disease, where delaying treatment until fetal viability can be both safe and practical.*

Purpose: *This evidence-based review aimed to summarize current evidence on the safety and outcomes of conservative management for early-stage cervical cancer during pregnancy.*

Methods: *We explored journal databases (PubMed, Cochrane, and Google Scholar). We included meta-analyses, systematic reviews, or observational studies published in English.*

Results: *We found three studies that fulfilled our inclusion criteria; they were two meta-analyses and one retrospective cohort study. Zuoxi et al concluded that there was no survival difference between the 2 groups (100% vs. 90.91%, P=0.54), and none of the pregnant women who died had delayed treatment due to pregnancy. Zeng et al, the primary outcome of interest is long-term survival, as pregnancy termination and timing of delivery did not significantly affect the 5-year OS (P > 0.05).*

Conclusion: *This evidence-based case report underscores the feasibility and clinical efficacy of a conservative, individualized management strategy for patients diagnosed with early-stage cervical cancer during pregnancy, where a comprehensive understanding of current evidence empowers clinicians and patients to collaborate on treatment plan that addresses both maternal survival and fetal well-being.*

Keywords: *pregnancy, cervical cancer, favorable fetal, maternal outcome*

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INTRODUCTION

Cervical cancer during pregnancy is uncommon but poses a complex clinical and ethical dilemma, requiring a delicate balance between timely maternal oncologic management and fetal preservation. Globally, abnormal cervical cytology is found in 1–5% of pregnancies, while invasive cervical cancer occurs in 1–12 per 10,000 pregnancies[1,2]. In Indonesia, the incidence continues to rise, with a 17% increase between 1990 and 2017 and a mortality rate of 3.7 per 100,000 in 2017[3].

Management decisions are multifactorial, influenced by gestational age at diagnosis, FIGO stage, tumor size, lymphovascular invasion, histological subtype, and the patient's desire to continue the pregnancy[4]. Historically, cervical cancer detected in early gestation was managed with pregnancy termination followed by radical treatment. However, contemporary approaches increasingly favor pregnancy preservation, especially in early-stage disease without nodal involvement[1].

Current treatment paradigms emphasize individualized, multidisciplinary care based on gestational age and disease stage[4,5]. For patients diagnosed during the first or early second trimester with locally advanced disease, early termination to permit prompt definitive therapy remains recommended to avoid delays that may compromise maternal prognosis. In contrast, patients diagnosed in the late second or third trimester with early-stage disease may safely defer treatment until fetal maturity, achieving comparable maternal outcomes[5-7].

This evidence-based case report presents the management of a 38-year-old woman, gravida 3 para 2, diagnosed with cervical cancer FIGO stage IB2 at 31 weeks of gestation, and explores current literature supporting conservative strategies to optimize both maternal and fetal outcomes.

Clinical Scenario

A case of cervical cancer FIGO stage IB2 was diagnosed at 31 weeks of gestational age

A 38-year-old woman, Gravida 3 Para 2, was referred to Cipto Mangunkusumo General Hospital for a cervical cytological test that is suggestive of squamous cell carcinoma of the cervix. The patient was found to be 30 weeks pregnant based on her last menstrual period. The patient had a chief complaint of postcoital bleeding and lower abdominal pain a month before coming to our hospital. This was her second marriage, with her first marriage occurring at the age of 15.

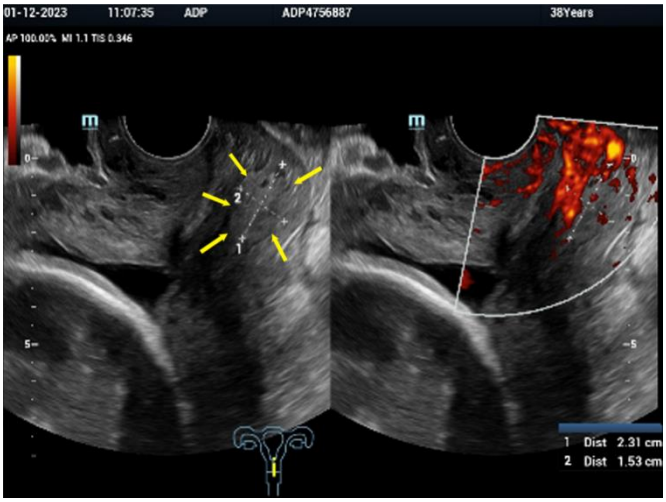
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Figure 1. Obsteric And Ultrasound Examination

Case Examination



(A)



(B)

Figure A. Speculum examination found an exophytic, friable mass in the cervix that bled easily, measuring 20 x 20 x 20 mm.
Figure B. Hypo-hyperechoic cervical mass measuring 23.1 x 15.3 x 17.1 mm and a volume of 36.1 mm^3, which aligns with squamous cell carcinoma of the cervix with a FIGO stage of IB

Speculum examination found an exophytic, friable mass in the cervix that bled easily, measuring 20 x 20 x 20 mm (Figure A). Rectovaginal touché found an exophytic mass limited to the cervix. Cervical biopsy and histopathological examination revealed papillary squamous cell carcinoma with moderate differentiation and no lymphovascular invasion. Her lab results were within normal limits. An obstetric ultrasound examination showed a 30-week-old fetus with a biparietal diameter of 87 mm, abdominal circumference of 307 mm, head circumference of 315 mm, femur length of 68 mm, and estimated fetal weight of 1600 grams. The fetal heart rate was measured at 138 bpm. The placenta was implanted in the posterior body of the uterus. No congenital anomalies were noted. An oncologic ultrasound showed a pathological, hypo-hyperechoic cervical mass measuring 23.1 x 15.3 x 17.1 mm and a volume of 36.1 mm^3, which aligns with carcinoma of the cervix with a FIGO stage of IB (Figure B). No mass infiltrated the myometrium, bilateral parametrium, bladder, or rectum. The liver and kidneys were within normal limits; no lymph node enlargement or free fluid in the pelvic cavity was visualized. Magnetic resonance imaging revealed a focal posterior cervical lesion sized 15 mm with no invasion to surrounding structures.

Patient had undergone fetal lung maturation and, pregnancy termination with caesarean section at 36 weeks gestation was indicated, followed by radical/total hysterectomy or chemoradiation after delivery. The fetus was delivered in good condition. The patient has been

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diagnosed with NED (No Evidence of Disease) and is indicated for another round of MRI examination.

Clinical Question

P (Patient/ Population)	: Pregnant patients diagnosed with FIGO stage IB1 cervical cancer in the second or third trimester.
I (Intervention)	: Preserving the pregnancy until fetal viability, with scheduled caesarean delivery at 36 weeks of gestation followed by radical hysterectomy.
C (Comparison)	: Immediate pregnancy termination or delivery upon diagnosis to facilitate prompt definitive oncologic treatment (neoadjuvant chemotherapy).
O (outcome)	: Maternal survival rate, disease progression during pregnancy, and neonatal outcomes (birth weight, Apgar scores, neonatal intensive care unit admission)

Study Selection

Study design and population

This review included meta-analysis, systematic review and observational studies involving pregnant women diagnosed with cervical cancer who were managed conservatively during gestation and subsequently underwent definitive oncologic surgery following a caesarean section.

METHODS

Search Strategy and Screening Criteria

We conducted a literature search by exploring online resources from several journal databases, including PubMed, Cochrane Library, Medline, and Google Scholar, using the terms “cervical cancer,” “pregnancy,” “timing of delivery,” “fetal maternal outcome,” and similar phrases. The retrieved articles were screened based on inclusion criteria, which comprised meta-analyses, systematic reviews, or observational studies. Review articles, conference abstracts, case series, case reports, and articles published in languages other than English were excluded..

Critical appraisal

After the articles were chosen according to the inclusion and exclusion criteria, each article will be assessed for its validity, importance and applicability using the critical appraisal worksheet for systematic reviews, randomized clinical trials, or observational studies provided by the Center of Evidence-based Medicine University of Oxford (www.cebm.net) for meta-analysis and randomized controlled trials, and Critical Appraisal Skills Programme (www.casp-uk.net) for observational studies, with some modifications to incorporate all the important findings. The level

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of evidence of each study was identified according to the Oxford Centre for Evidence-Based Medicine classification.

RESULT

We used Pubmed, Cochrane, and Google Scholar as search engines. Search queries from the online databases can be seen in **Table 1**

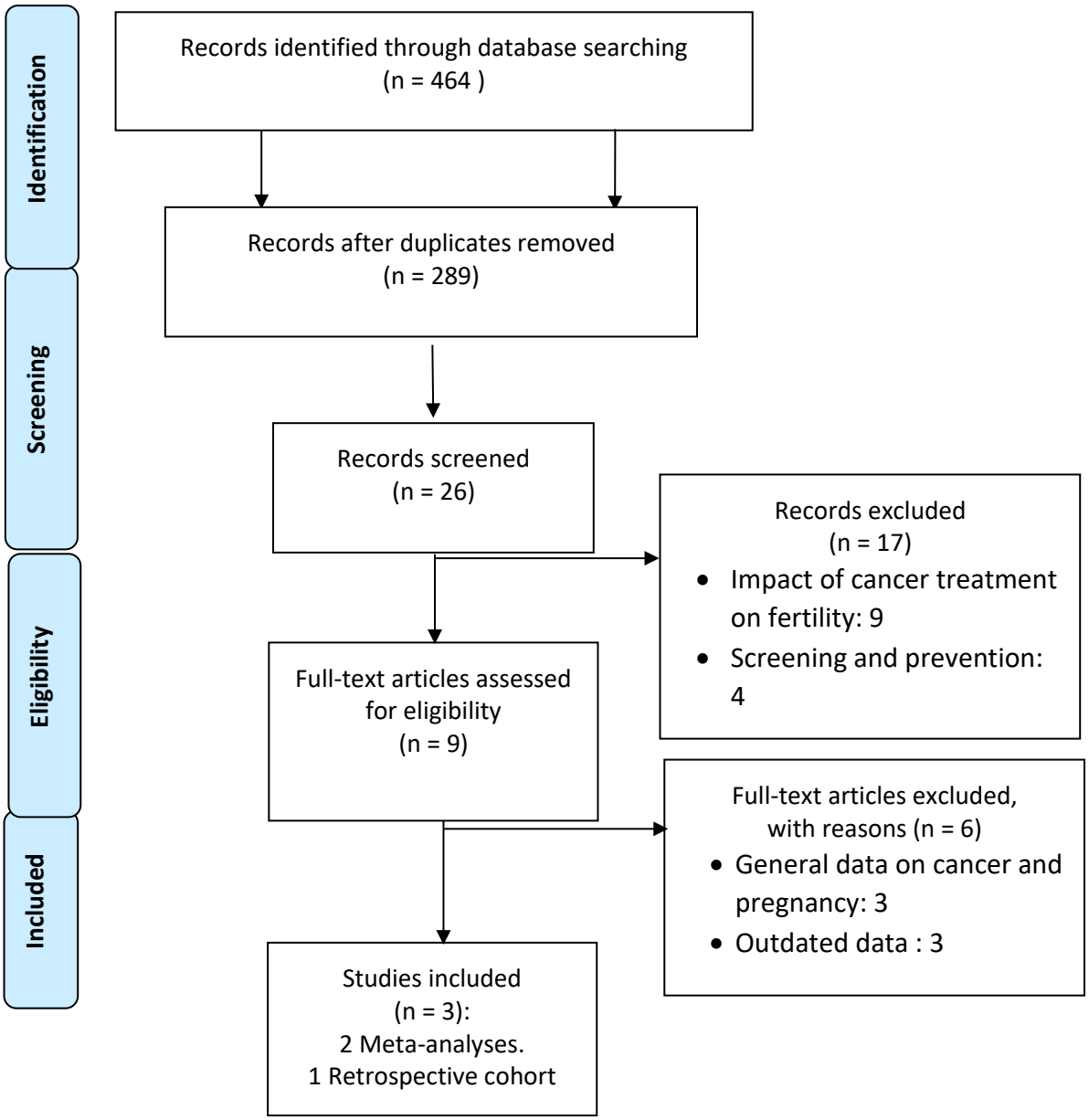
Table 1. Search queries used for literature searching in journal databases (September 5th, 2025)

	Keywords		
PubMed	((cervical cancer pregnancy) AND (pregnancy) AND (fetal outcome) AND (maternal outcome))	126	11
Cochrane	((cervical cancer pregnancy) AND (pregnancy) AND (fetal outcome) AND (maternal outcome))	145	6
Google Scholar	((cervical cancer pregnancy) AND (pregnancy) AND (fetal outcome) AND (maternal outcome))	193	9

After screening, 26 journals were identified. We kept 9 journals for further assessment and excluded 17 of them, then we decided 3 journals for critical appraisal.

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Flow chart of literature searching strategy were presented in Figure 2.



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Reference	Study design	Subjects	Determinants	Inclusion criteria	Exclusion criteria	Outcome
Zuoxi He, et al (2022)	Retrospective study	40 patients with clinical cancer stages of IA1, IB1, IB2,IIA and IIB. There were 38 patients diagnosed during pregnancy, and 2 diagnosed in the postpartum period.	**I :** Conservative management by preserving the pregnancy (the pregnancy - preserving group) and delaying definitive therapy until after delivery. **C :** Radical management with immediate therapy (the pregnancy - terminating group) involving termination of the pregnancy to allow for cancer treatment without delay..	All diagnoses were confirmed by pathological examination of the cervical biopsy. patients diagnosed during pregnancy and within six months following delivery.	Exclusion features were negative result	There was no survival difference between the 2 groups (termination and continuation group) (100% vs. 90.91%, *P* = 0.54), and none of the pregnant women who ultimately died had delayed treatment due to pregnancy. Similarly, the surgical estimated blood loss and operative duration comparison in the 2 groups were not significantly different.
Zeng, et al (2025)	Systematic review	The cohort studies, case-control	I : intervention and prognostic factors :	Patients who were pathologically diagnosed with CCIP.	Literature reviews, editorials, letters, conference	The primary outcome of interest is **long-term survival**, specifically

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Reference	Study design	Subjects	Determinants	Inclusion criteria	Exclusion criteria	Outcome
		studies, randomized controlled trials, and non-randomized controlled trials involving CCIP patients with data on 5-year overall survival (OS) were included in this study.	clinicopathological factors, treatment strategies C : The primary comparator is non-pregnant patients with cervical cancer. the study compares different subgroups within the CCIP population against each other (e.g., patients with small tumors vs. large tumors, or patients who delivered vaginally vs. via caesaran section).	Outcome measure 5 years, relevant subgroup information, relevant study design : cohort studies, case-control studies, randomized controlled trials, or non-randomized controlled trials.	abstracts, commentaries, meta-analyses, case reports, and animal studies; (2) non-English studies; (3) duplicate publications or studies without the full text; (4) studies lacking the outcome measure of the 5-year OS; (5) studies reported in combination with other malignant tumors.	measured as the **5-year overall survival (OS)**. The study seeks to determine whether the specified interventions or prognostic factors have a statistically significant effect on this outcome.

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Reference	Study design	Subjects	Determinants	Inclusion criteria	Exclusion criteria	Outcome
Dabrowska, et al (2024)	Systematic review	Seven articles on 317 pregnant women with cervical cancer	Stage of disease, gestational age at diagnosis, treatment in pregnancy, type of delivery, gestational age of delivery, treatment after delivery, follow-up	Articles covered the diagnosis, treatment, pregnancy termination, and delivery of cervical cancer in pregnant women	Studies in languages other than English Studies published as abstracts or letters Articles that focused only on gynecological cancers in pregnancy without considering cervical cancer.	**Maternal:** Oncologic response, recurrence rates, survival, and treatment-related complications. **Fetal/Neonatal:** Gestational age at birth, birth weight, neonatal complications, and overall infant health.

Study from Zuoxi He, et al (2022)[8] is retrospectively analyzed all cervical cancer patients diagnosed while pregnant or immediately postpartum, inclusive from Jan 2010 to June 2019 at our institute. Patient clinical details and follow-up were obtained from hospital records. The study comprised 40 patients with clinical cancer stages of IA1 (1/40, 2.5%); IB1 (15/40, 37.5%); IB2 (10/40, 25%); IIA (12/40, 30%); and IIB (2/40, 5%). There were 38 patients diagnosed during pregnancy, and 2 diagnosed in the postpartum period. Of the 38 patients, 17 were diagnosed in the first trimester, 13 in the second trimester, and 8 in the third trimester. 10 of 38 patients (26.3%) continued their pregnancy after learning of their diagnosis; 7 (70%) in the third trimester and 3 (30%) in the second trimester. The mean time from diagnosis to surgery in the patients who continued their pregnancy was 52.7 days, which was statistically significantly greater than the termination of pregnancy group (52.7 vs. 16.3 days, $P<0.01$). Notably, there was no survival difference between the 2 groups (100% vs. 90.91%, $P=0.54$), and none of the pregnant women who ultimately died had delayed treatment due to pregnancy. Similarly, the surgical estimated blood loss and operative duration comparison in the 2 groups were not significantly different. In the present study, the gestational age of pregnancy at the time of initial diagnosis of cervical cancer was an important determinant in the disease management. Continuation of the pregnancy when diagnosed with cervical cancer may not affect the oncologic outcome of the mother nor increase either surgical or obstetric complications. Additionally, the use of neoadjuvant chemotherapy did not threaten the health of the fetus

Systematic review and meta-analysis study form Zeng, et al (2025)[9] aimed to evaluate the prognosis of cervical cancer in pregnancy (CCIP) and analyze the clinicopathological factors affecting the prognosis of this cancer. The cohort studies, case-control studies, randomized controlled trials,

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and non-randomized controlled trials involving CCIP patients with data on 5-year overall survival (OS) were included in this study. he results demonstrated that the 5-year OS of patients with CCIP was similar to that of non-pregnant patients with cervical cancer (RR = 1.00, 95% CI: 0.94–1.06, *P* = 0.978). The subgroup analysis results revealed that tumor size (≥ 4 cm), International Federation of Gynecology and Obstetrics (FIGO) stage (≥ IB2), and timing of diagnosis (postpartum) were prognostic factors with statistical significance (*P* < 0.05). However, such factors as pregnancy termination and timing of delivery did not significantly affect the 5-year OS (*P* > 0.05). The delivery mode required further validation despite its borderline significance (*P* = 0.05). The results of this study suggest that pregnancy does not exert a significant adverse effect on the long-term survival of patients with cervical cancer. Tumor size (≥ 4 cm), FIGO stage (≥ IB2), and time of diagnosis (postpartum) are identified as unfavorable prognostic factors for CCIP patients, while delivery mode requires further investigation.

Study systematic review from Dabrowska (2024)[10], aimed to synthesize evidence on the various management strategies for cervical cancer diagnosed during pregnancy by analyzing outcomes from multiple published studies. The findings indicate that for early-stage disease (primarily Stage IB1, tumors <2 cm), expectant management is a well-supported option, with studies reporting maternal recurrence rates typically below 5% in carefully selected patients who delayed treatment until postpartum. For more locally advanced stages, platinum-based neoadjuvant chemotherapy (NACT) demonstrated high efficacy, with collective data showing tumor response rates (complete or partial) frequently exceeding 80%, effectively controlling the disease and allowing the pregnancy to continue. Neonatal outcomes were directly correlated with gestational age at delivery; while congenital malformation rates were not found to be elevated above baseline, the rate of iatrogenic prematurity (delivery <37 weeks) was significant, often reported in over 50% of cases managed with active intervention, making it the primary source of neonatal morbidity. In conclusion, the review's synthesis of available data confirms that a tailored, multidisciplinary approach is evidence-based, allowing treatment to be safely adapted to optimize both maternal survival and neonatal health, where the main challenge remains the management of planned prematurity.

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Table 3. Critical appraisal of retrospective study

Article: Zuoxi He, et al (2022) **Level: 2B (retrospective study)**		
Validity	Did the study address a clearly focused issue?	**Yes,** the study has a clearly focused objective: to evaluate the outcomes of patients with cervical cancer diagnosed during pregnancy who underwent pregnancy preservation. The research question is well-defined, addressing a specific patient population and an intervention/exposure (preserving pregnancy).
	Was the cohort recruited in an acceptable way?	**Yes.** The study is retrospective, utilizing a specific hospital's database. The study's generalizability might be limited as the cohort is from a single center, potentially introducing selection bias. The exclusion and inclusion criteria appear appropriate, but the lack of a control group makes direct comparison difficult.
	Was the exposure accurately measured to minimise bias?	**Yes.** he "exposure" is the decision to preserve the pregnancy. This is likely well-documented in the medical records, reducing measurement bias.
	Was the outcome accurately measured to minimise bias?	**Yes.** The outcomes (maternal survival, disease-free survival, pregnancy outcomes) are clear and likely well-documented in a hospital setting. This reduces the risk of outcome measurement bias. The use of established diagnostic and follow-up protocols strengthens the reliability of the data.
	Have the authors identified all important confounding factors?	**Yes.** The authors mention some variables like tumor stage and gestational age at diagnosis, which are key confounders.
	Have they taken account of the confounding factors in the design and/or analysis?	Yes, the authors took some important confounding factors into account in analysis
	Was the follow up of	**Yes.** The study's median follow-up time must be

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Article: Zuoxi He, et al (2022)
Level: 2B (retrospective study)

	subjects complete enough?	long enough to capture both short-term outcomes (e.g., pregnancy complications) and long-term outcomes (e.g., cancer recurrence, survival).
	Was the follow up of subjects long enough?	**Yes.** The study reports a median follow-up period of 57.3 months, which is nearly 5 years.
Importance	What are the results of this study?	The study's results describe the outcomes of pregnancy preservation, including the rates of live births, preterm births, maternal survival, and disease-free survival.
	How precise are the results?	The precision of the results is indicated by the confidence intervals (CIs). A narrow CI suggests a more precise estimate.
	Do you believe the results?	**Yes.** The results are believable for this specific group of patients.
Applicability	Can the results be applied to the local population?	**Yes.** Factors such as patient demographics, standard of care, and treatment protocols may differ. The study's results can provide a valuable reference but may not be directly translatable without considering these differences.
	Do the results of this study fit with other available evidence?	**Yes.** the results are consistent with other studies, it strengthens the evidence base.
	What are the implications of this study for practice?	The study provides insight into the feasibility and outcomes of pregnancy preservation in a specific context. it can contribute to shared decision-making discussions with patients.

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Table 4. Critical appraisal of systematic review/ meta-analysis study

Article: Zeng et al (2025) **Level: 1A (systematic review)**		
Validity	Did the meta-analysis address a focused question?	**Yes.** The review addresses the prognosis of cervical cancer in pregnancy (CCIP) and the impact of treatment strategies on outcomes, specifically focusing on prognostic factors and 5-year overall survival (OS).
	Were the criteria used to select articles for inclusion appropriate?	**Yes**. The inclusion of various study designs (cohort, case-control, and RCTs) indicates a broad and comprehensive search strategy.
	Is it likely that important relevant studies were missed?	**Yes.** The authors performed a systematic search across major medical databases (e.g., PubMed, Embase, Cochrane Library), which is standard practice for systematic reviews.
	Was the validity of the included studies appraised?	**Yes.** The abstract explicitly states that the quality of included studies was assessed using the Newcastle-Ottawa Scale (NOS). This is a crucial step for a review of prognosis, as the NOS is a validated tool for assessing the quality of non-randomized studies.
	Were the results similar from study to study?	**No,** The review found both homogeneity and heterogeneity
Importance	What are the overall results of the meta-analysis?	The results demonstrated that the 5-year OS of patients with CCIP was similar to that of non-pregnant patients with cervical cancer (RR = 1.00, 95% CI: 0.94–1.06, *P* = 0.978). The subgroup analysis results revealed that tumor size (≥ 4 cm), FIGO stage (≥ IB2), and timing of diagnosis (postpartum) were prognostic factors with statistical significance (*P* < 0.05). However, such factors as pregnancy termination and timing of delivery did not significantly affect the 5-year OS (*P* > 0.05).
Applicability	Can the results be applied to my patient care?	**Yes.** The findings are directly applicable to obstetric and gynecologic practice. The study population (CCIP patients) is a direct match for the clinical scenario. The results provide valuable evidence for counselling and managing pregnant patients with cervical cancer.

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Article: Zeng et al (2025) **Level: 1A (systematic review)**	
Were all clinically important outcomes considered?	The review's primary focus is on 5-year overall survival, which is the most critical long-term outcome. However, it does not extensively report on other crucial outcomes like fetal morbidity and mortality, maternal complications related to treatment, or long-term fertility.
Are the benefits worth the harm and costs?	**Yes.** The results provide a strong evidence base to inform treatment choices. The finding that pregnancy itself does not worsen prognosis provides strong support for delaying definitive treatment in cases where the fetus is not yet viable, as long as the cancer is appropriately monitored and doesn't show signs of progression. This allows for fetal maturity without compromising maternal survival

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Table 5. Critical appraisal of systematic review/ meta-analysis study

Article: Dabrowsk a, et al 2024 **Level : 1A (systematic review)**		
Validity	Did the meta-analysis address a focused question?	**Yes.** The review had a well-defined question. The Population (pregnant women with cervical cancer), Interventions (various management strategies), and Outcomes (maternal and neonatal health) were clearly articulated, providing a solid foundation for the review.
	Were the criteria used to select articles for inclusion appropriate?	**Yes.** The inclusion criteria were appropriate for the question, focusing on studies that described clinical management and outcomes for this specific patient group.
	Is it likely that important relevant studies were missed?	**No.** This is a significant methodological weakness. The search was restricted to a single database (PubMed). A valid, comprehensive systematic review must search multiple databases (e.g., Embase, Cochrane) and should attempt to find unpublished studies (*grey literature*) to minimize **selection bias**.
	Was the validity of the included studies appraised?	**No.** This is a critical flaw. The authors did not report using any formal tool to appraise the methodological quality or risk of bias of the studies they included. Without this step, low-quality, biased studies may be given the same weight as higher-quality studies, fundamentally undermining the validity of the review's conclusions.
	Were the results similar from study to study?	**No.** the studies were very different (heterogeneous), but they point toward the same clinical conclusions (consistent).
Importance	What are the overall results of the meta-analysis?	For early-stage disease, delaying definitive treatment until fetal maturity is a safe and feasible option for carefully selected patients. For locally advanced disease, neoadjuvant chemotherapy (NACT) is an effective tool to control the tumor while allowing the pregnancy to continue.
Applicability	Can the results be applied to my patient care?	**Yes.** The clinical scenario of cervical cancer in pregnancy is a universal one. The review discusses management options that are broadly applicable across different healthcare settings. The patient

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Article: Dabrowsk a, et al 2024 **Level : 1A (systematic review)**		
		characteristics and biological nature of the disease do not vary significantly by geography, making the findings clinically relevant to most practices.
	Were all clinically important outcomes considered?	**Yes.** The review appropriately considered the dual outcomes that matter in this context: maternal oncologic outcomes (survival, recurrence) and key neonatal outcomes (prematurity, health at birth). This makes the findings highly relevant to clinical decision-making and patient counselling.
	Are the benefits worth the harm and costs?	**Yes,** the review helps weigh them**.** The paper provides the evidence base to facilitate the crucial risk/benefit discussion with patients. For example, it helps clinicians weigh the benefit of achieving fetal maturity against the potential harm of delaying maternal cancer treatment.

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DISCUSSION

The determination of the optimal timing for delivery in pregnancies complicated by cervical cancer represents a profound clinical challenge, necessitating a delicate balance between maternal oncologic imperatives and the mitigation of neonatal morbidity associated with prematurity. The decision-making process is not governed by a rigid protocol but by a highly individualized, risk-adapted strategy, ideally formulated within a multidisciplinary team (MDT) framework. The consensus in contemporary literature establishes a general therapeutic window for delivery between 34 and 37 weeks' gestation, with the final timing contingents upon several key factor.[4]

A patient was first diagnosed with cervical cancer FIGO Stage 1B2 at 31 weeks of gestational age. The decision was made not to terminate the pregnancy, but instead to manage the patient conservatively until 36 weeks of gestation. Both maternal and fetal conditions were monitored closely until the planned termination of pregnancy.

Treatment Cervical Cancer In Pregnancy

Based on ESGO Guideline

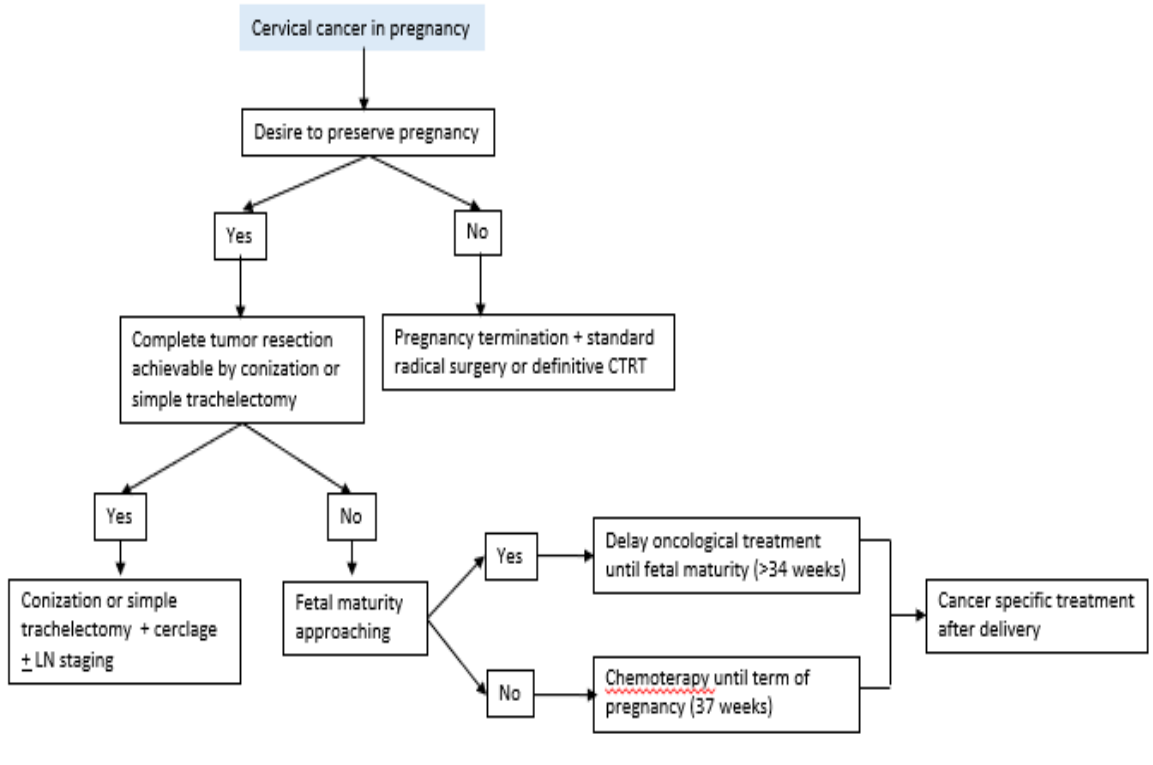


Figure 3. Guideline Algorithm cervical cancer in pregnancy by ESGO.[5]

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Pregnancy-Preserving Management

A cone biopsy may be used to treat stage IA1 tumors without lymphovascular space invasion. For stage IA1 with lymphovascular space invasion, IA2 and IB1, staging lymphadenectomy should be performed as a first step. This can be safely done up to the 22 week of gestation. After the 22 week of gestation, delayed treatment after delivery with regular follow-up could be initiated. Alternatively, neoadjuvant chemotherapy (NACT) could be used to control the disease. In the case of positive nodes (including micro metastases), we recommend termination of pregnancy. After the 22 week of gestation, only NACT is an option In stage IB3 (according to the new FIGO 2018 classification)[11], the only pregnancy-preserving option is the application of NACT.[12] The role of staging lymphadenectomy is controversial.[13] With increasing gestational age, a delay of definitive treatment is more commonly used, though NACT (until the 34–35 week of gestation) will prolong the duration of pregnancy until term delivery.[14]

Based on ESGO guideline, this patient who desire to preserve pregnancy, we can did the fetal maturity approach and delay oncological treatment until fetal maturity (>34 weeks of gestational age) also cancer specific treatment until delivery.

Based on ESMO Guideline

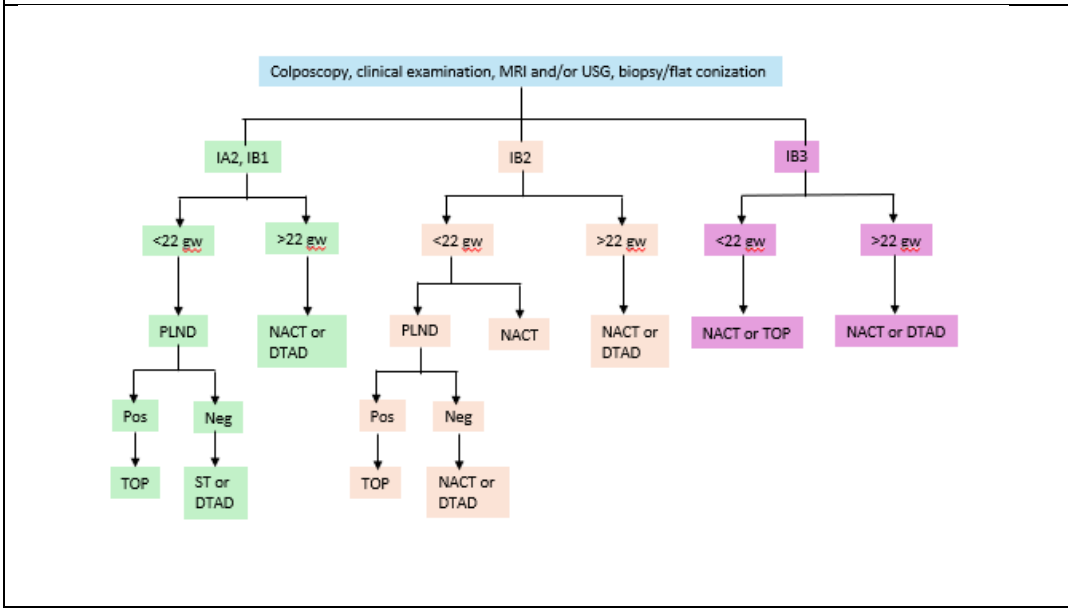


Figure 4. Guideline Algorithm cervical cancer in pregnancy by ESMO.[13]

Pregnancy Non-Preserving Management

Pregnancy non-preserving management is chosen in advanced disease (stage IIB or higher or lymph node metastases) or in cases when the patient chooses not to preserve her pregnancy (based on local legislation and usually until the 24 weeks of gestation). Treatment is thus planned without intention to preserve the fetus. In case of an operable disease (IA2-IB2), a radical hysterectomy with fetus in utero (during the first or early-second trimester) or after hysterotomy (during the late second trimester) can be performed. In IB3 and higher stages, during first trimester

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chemoradiation can be applied with the fetus in utero (the death of the fetus occurs within few days), while during second trimester a hysterotomy as a first step is advised.[14]

Timing To Delivery

The cornerstone of the management algorithm is the intersection of tumor stage and the gestational age at diagnosis.[10] According to the European Society of Gynaecological Oncology (ESGO) guidelines, the recommendation for pregnancy termination in patients with cervical cancer is principally dictated by the interplay between tumor stage and gestational age at diagnosis.[4,5] For patients presenting locally advanced disease (FIGO stage IB2 or higher) within the first or early second trimester (generally <22 weeks of gestation), the guidelines unequivocally advocate for pregnancy termination. This recommendation is based on the oncologic imperative for immediate definitive therapy, such as primary chemoradiation, as any significant delay to await fetal viability would pose an unacceptable risk of disease progression and adversely impact maternal survival.[4,15]

For patients with early-stage, small-volume disease (e.g., FIGO Stage IB1, tumors <2 cm) diagnosed in the second or third trimester, a strategy of expectant management is often deemed appropriate. In such cases, the objective is to prolong gestation to or near term (approximately 37 weeks) to maximize fetal maturity, as the risk of significant cancer progression over a limited timeframe is considered low.[16]

Delaying Definitive Treatment

Delaying definitive treatment to improve fetal outcomes, although beneficial to the fetus, may carry an additional risk of tumor progression.[17] Morice et al. retrieved published data on delayed treatment and described the outcomes for 76 patients diagnosed mostly with localized tumors (96% rate of FIGO 2009 IB tumors). Even with a median delay of 16 weeks, excellent oncological outcomes were demonstrated, with a 95% survival rate at a mean follow-up of 37.5 months.[18] Amongst them, Lee et al. reported outcomes after delayed treatment for 12 patients. Two patients, diagnosed with FIGO IB2 and IB3 (FIGO 2018) cervical cancer, died of the disease, with a mean delays of treatment of 6 and 4 weeks, respectively.[19] Ishioka et al. reported planned delay of treatment for patients diagnosed with IB1-IIB cervical cancer. No apparent tumor growth was reported, although surgery had to be preempted for one patient due to pain (parametrial invasion).[21] According to the most recent guidelines, a delay in definitive treatment may be considered feasible for patients diagnosed with IA2-IB3 tumors diagnosed after 22 weeks of gestational age, subject to close monitoring,[4] with the aim to obtain fetal maturity (>37 weeks of gestational age). The ESMO guidelines also support delayed treatment and careful monitoring of the patient at all early stages.[14] When progressive disease is observed, either termination of pregnancy or NACT should be advocated.[17]

Our case underscores that a judiciously delayed definitive treatment for early-stage cervical cancer during pregnancy does not adversely affect the mother's oncological prognosis. In this particular case, the decision to manage the patient conservatively and defer radical hysterectomy until after a viable delivery at 36 weeks of gestation did not compromise the maternal outcome.

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This approach is supported by recent meta-analyses, which have challenged the historical assumption that pregnancy progression inherently worsens cervical cancer survival. The successful management and favorable outcome in our patient reinforce the safety and efficacy of this conservative strategy, provided there is close monitoring and the absence of rapid disease progression. This case serves as a compelling example that, for carefully selected patients with early-stage disease, prioritizing fetal maturity through delayed intervention can be achieved without compromising the mother's long-term survival.

Cervival Cancer And Maternal Impact

Based on cohort study by Aaron et al (2025)[23], there was a significantly increased rate of chronic hypertension among women in the cervical cancer group. Another study found that metabolic syndromes (hypertension included) were associated with an increased risk of persistent cervical HPV infection[24,25] It is theorized that metabolic syndromes increase the risk of HPV infection or persistence due to elevated levels of estrogen (seen in obesity or insulin resistance) and inflammatory cytokines. The inflammation inherent in the metabolic syndrome minimizes the body's ability to fight infection likely including HPV.[24] Moreover, hypertension is also associated with a faster progression of cervical cancer. According to a study conducted in China, patients with hypertension and cervical cancer were found to have an increased risk of parametrial invasion and poorer overall survival rates.[24,26]

Pregnancies complicated by cervical cancer are associated with significant hematologic sequelae. Affected patients demonstrate a higher incidence of venous thromboembolism (VTE), including deep venous thrombosis and pulmonary embolism, as well as an increased need for blood transfusions. This finding is consistent with previous research indicating that all gynecologic malignancies elevate the risk of VTE, with cervical cancer exhibiting the strongest association among them.[27] The pathophysiology underlying this increased incidence of thromboembolism is multifactorial. The malignancy itself alters systemic physiology, fostering a hypercoagulable and proinflammatory milieu that predisposes the patient to thrombus formation. Concurrently, the neovascularity and friability of the malignant cervical tissue create a significant propensity for hemorrhage,[28] particularly in the presence of a vaginal delivery (which was the mode of delivery in a quarter of subjects in this study), it is not surprising that blood transfusions were increased. While the low incidence of thromboembolic events in this cohort limits definitive conclusions and necessitates further investigation in larger studies, the observation aligns with the anticipated pathophysiology of the disease.

Fetal Risk Related to Cervical Cancer

Pregnant women with cervical cancer were found to have an elevated risk of preterm delivery alongside a reduced likelihood of both operative and spontaneous vaginal deliveries. This finding may be partially explained by a previous American study, which demonstrated that more frequent cervical cancer screening is itself a risk factor for non-iatrogenic preterm delivery.[26] Another study with similar findings suggests that cervical conization or trachelectomy, a method used to both diagnose and treat cervical cancer, is associated with an increased risk of preterm

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delivery.[29] Retrospective study by Harnett et al[30] stated that there was a high risk of preterm birth in cervical cancer survivors, with 28% of live births delivered before 37 weeks (RR=2.8, 95% CI: 2.1, 3.7), and 10% delivered before 32 weeks (RR=5.4, 95% CI: 3.1, 9.6). Infants born to cervical cancer survivors also had higher risks of low birth weight (RR=2.8, 95% CI: 2.0, 4.0) and very low birth weight (RR=4.3, 95% CI: 2.3, 8.2) than infants born to matched comparison women, and were more likely to be delivered by C-section (RR=1.5, 95% CI: 1.3, 1.8). However, infants born to cervical cancer survivors did not have a higher risk of being born SGA than infants born to comparison women (RR=0.7, 95% CI: 0.4, 1.4).[30] In this case, no maternal or fetal complications were observed during the conservative management period.

Cervical Cancer and Nutrition

Nutrition plays an essential role in the development and progression of cervical cancer, interacting with HPV infection and influencing immune response and oxidative stress balance[31,32]. Diets low in fruits, vegetables, and antioxidants are associated with a higher risk of cervical intraepithelial neoplasia, whereas sufficient intake of folate, vitamins A, C, E, and carotenoids may exert protective effects by enhancing immune surveillance and DNA repair[33–35]. In contrast, a Western-type diet rich in processed meat, salty foods, and refined carbohydrates has been linked to increased HPV persistence and chronic inflammation, which may promote carcinogenesis[33,34]. Adequate folate and vitamin B12 levels appear crucial for maintaining genomic stability and supporting HPV clearance, although excessive supplementation might paradoxically stimulate tumor cell growth[36,37]. Overall, adherence to a balanced, antioxidant-rich dietary pattern such as the Mediterranean diet may contribute to lowering the risk of HPV-related cervical malignancy and complement established preventive measures[33–38].

The Role of Multidisciplinary Teams in Managing Cervical Cancer in Pregnancy

A coordinated multidisciplinary approach is essential to optimize both maternal safety and fetal outcomes, aligning with evidence from other complex pregnancy conditions[39]. Effective management relies not only on collaboration among specialists but also on early detection, HPV vaccination, and timely referral, all of which remain critical to improving maternal and neonatal outcomes[40].

CONCLUSION

Current evidence strongly supports that for early-stage disease, the pregnancy can be safely preserved until term with appropriate surveillance, with or without NACT. This modern approach successfully achieves the dual goal of ensuring maternal oncologic safety while simultaneously optimizing fetal outcomes. Definitive oncologic surgery, such as a radical hysterectomy can then be performed effectively and safely in the same session as the caesarean delivery. This case highlights that, with careful patient selection and a collaborative multidisciplinary approach, pregnancy preservation in the setting of stage IB2 cervical cancer can be safely achieved, leading to favorable maternal oncologic outcomes without compromising neonatal well-being.

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