

Stop! Check your initial assumptions

Frozen patient management in obstetrical practice

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Abstract

At times, leaping from one patient management routine to an alternative one may be required to mitigate medical errors. “Frozen patient management” is the resultant situation, when, in the face of an obvious gap between the expected and the actual phenomena, leaping from current patient management to an alternative one is not considered or done. Frozen patient management can lead to a significant delay of the correct definitive intervention, be it surgical or pharmacological. The significance of this delay is especially important in time-dependent dynamic situations. In delivery ward, this may cost the life of either the fetus or the mother.

In this study, we describe a sequence in which frozen patient management occurred in the delivery ward. Using “thinking protocol” (herein termed “de-freezing” questionnaire) made the team stop and consider a leap when gaps became apparent, and saved the mother’s life.

We believe that adopting the “de-freezing questionnaire” as a routine adjunct for all medical activities would lead to a timely change of treatment line, which, in turn, will save lives and unnecessary suffer.

Abbreviations: ALT = alanine transaminase, AST = aspartate transaminase, E3 = estriol, HELLP = hemolysis, elevated liver enzymes, low platelets, MOM = multiples of the median, PET = pre-eclamptic toxemia, PT/PTT = protrombin time/partial thromboplastin time.

Keywords: de-freezing, delivery room, missed diagnosis, patient management, patient safety, stagnant medical treatment

“AT A CARDIAC ARREST, THE FIRST PROCEDURE IS
TO TAKE YOUR OWN PULSE”
The House of God

1. Introduction

To err is part of medical reality.^[1] To mitigate medical errors, at times, leaping from one patient management routine to an alternative one, may be required.^[2,3] Such leaping becomes vital when a gap between the expected and the actual findings appears. In practice, there are too often events during which medical teams fail to do so. “Frozen patient management” is the resultant situation, when, in the face of an obvious gap between the expected and the actual phenomena, leaping from current patient management to a more appropriate one is not considered or done.^[2] We have recently formulated a “thinking protocol” (herein termed “de-freezing” questionnaire) that makes medical teams stop and consider a leap when gaps appear (“take your own pulse”).^[4]

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The de-freezing questionnaire has the following 3 steps:

Step 1: includes gap identification, in which physician identifies if any gap occurred between the expected and the actual physical findings, patient’s reaction, or laboratory results.

Step 2: includes assigning any of the following 4 possible prototypical causes to the gap:

- i. Conceptual cause: The performance of actions under an unfit or incorrect concept, for example, diagnostic error;
- ii. Mistake cause: Simply the case of administering the wrong drug or surgical procedure;
- iii. Overdoing cause: Adding unnecessary elements, for example, giving a patient an unnecessary medication;
- iv. Underdoing cause: The deletion of necessary elements, for example, refraining from the administration of a required medication. Unlike the conceptual cause for a gap, the other 3 occur under the correct diagnosis or treatment plan. To correctly implement the de-freezing questionnaire, it is mandatory that all 4 causes be considered.

Step 3: includes physicians’ response to the gap. This step starts with estimation of the likelihood of each prototypical cause to lead to the specific gap. This estimation is subjective and relies mainly on personal experience and judgment. If the most likely cause is treatment plan concept error or diagnostic error, the physician should consider leaping to an alternative treatment plan or diagnosis. If the most likely cause is mistake cause, overdoing cause, or underdoing cause, the physician should check the actual implementation of the treatment plan.

Having had this conceptual understanding, we encountered a case in which the protocol saved a pregnant woman in the delivery ward. Pre-eclamptic toxemia (PET) is a gestational pathology that involves hypertension and proteinuria during the third trimester of pregnancy. In its extreme form, it may lead to a convulsive state called eclampsia. Another form of severe PET is seen with hemolysis, elevated liver enzymes, and low platelet

Table 1**The de-freezing questionnaire.**

Gap description	Prototypical causes for gaps		The likelihood of each prototypical gap (1–10)	Response to the gap
Severe pain with no correlation in physical findings (gastritis is not expected to lead to this degree of pain)	Conceptual cause	Wrong diagnosis	8	Hospitalization and further laboratory and clinical follow-up
	Mistake cause	Inadequate treatment	2 (the only treatment was against gastritis)	
	Overdoing cause	Unnecessary drug quantity	2 (the only treatment was against gastritis)	
	Underdoing cause	Not enough drug	2 (the dosage adequate for the diagnosis)	

count, dubbed hemolysis, elevated liver enzymes, low platelets (HELLP). At times, the appearance of HELLP may be partial and gradual. In the presented case, the patient had a clinical presentation that heralded the appearance of HELLP, but was overlooked.

2. De-freezing implementation

A 28-year-old, otherwise healthy, pregnant woman (gravida 2, para 1) was admitted to the hospital at 32 weeks 5 days of gestation because of epigastric pain and vomiting with no other symptoms. Until this visit, her pregnancy follow-up was normal and included: normal nuchal translucency (1.2 m''m, 1:8000), normal anatomical survey at the 15th week, normal integrated test (1:7700, alpha fetoprotein 0.61 multiples of the median [MOM], human chorionic gonadotropin 0.54 MOM, E3 0.84 MOM, pregnancy-associated plasma protein A 0.36 MOM, and free BHCg 0.57 MOM—all within normal limits), normal complementary anatomical survey at 22 weeks, and negative glucose challenge test. Her first pregnancy was unremarkable and she had a normal vaginal delivery at term.

On presentation, her vital signs were normal. Physical examination revealed mild epigastric pain upon palpation with no other findings (ie, a gap, see “Discussion” section). Gynecological examination, including obstetrical ultrasound, was unremarkable. Complete blood count, electrolytes, liver enzymes, and prothrombin time/partial thromboplastin time (PT/PTT) were normal. The patient was examined by an internal medicine specialist, and gastritis was suspected. The day after her hospitalization, her symptoms resolved spontaneously, her vital signs were all normal, and she was discharged from the hospital.

A day after being discharged, the patient was admitted again to the hospital due to the same complaints (ie, a gap, see “Discussion” section). On presentation, her blood pressure was 137/87 (ie, a gap, see “Discussion” section), and other signs were normal. Physical examination revealed the same mild epigastric sensitivity to palpation with no other findings. Gynecological examination was unremarkable. Laboratory tests revealed elevated aspartate transaminase (AST) and alanine transaminase (ALT) levels (110 IU/L and 82 IU/L, respectively) without any other positive findings in blood chemistry, complete blood count, and PT/PTT.

While in hospital, she was given papaverine and ranitidine intravenously, her symptoms resolved, her blood pressure and vital signs were normal throughout her stay, and a follow-up laboratory test revealed stable AST and ALT levels (94 IU/L and 88 IU/L, respectively). With the diagnosis of gastritis, the patient was discharged (ie, frozen patient management).

On the same day of discharge, the patient was admitted again to the hospital due to the same complaints (ie, gap, see “Discussion” section). Her vital signs were normal. Physical

examination revealed mild epigastric sensitivity upon palpation with no other findings. Gynecologic examination was unremarkable, including fetal heart rate monitoring. The patient was examined again by an internal medicine specialist, and gastritis was suspected. She was examined also by a general surgeon, who ordered upper abdominal ultrasonography, which was interpreted as normal, and no acute indication for surgical intervention was identified. Her complete blood count revealed a normal and stable hemoglobin level (12 g/dL), normal leukocytes, and mild thrombocytopenia 137,000/mL.

With the clinical diagnosis of gastritis, she was treated with proton pump inhibitors during her stay at the hospital, her symptoms resolved, and she was discharged again (ie, frozen patient management).

The day after her discharge, the patient was again admitted to the hospital due to the same complaints of epigastric pain with no other symptoms (ie, gap, see “Discussion” section). On presentation, her blood pressure was 147/88 (a gap, interpreted at the time as caused by excitement from the pain), and pulse and temperature were normal. Her physical examination revealed, as before, mild epigastric sensitivity upon palpation without any additional findings. However, her degree of discomfort was extreme, and this gap between the objective findings and her subjective complaint was taken as an indication for further studies and hospitalization (identification of the gap and initial response, which allows further thinking). Complete blood count revealed normal hemoglobin level (12.1 g/dL), thrombocytopenia 86,000/mL, further elevated liver enzymes (AST 100 IU/L and ALT 132 IU/L), and lactate dehydrogenase (LDH) was also elevated 820 U/L. During the few hours after her hospitalization, blood pressure climbed to a maximum of 176/94 among other abnormal values. A follow-up blood test revealed further increase in liver enzymes and LDH.

At this point, the obstetrician who was trained in the de-freezing questionnaire became involved (see Table 1).

Step 1: included gap identification. The obstetrician identified the following gaps: severe abdominal pain, hypertension, elevated liver enzymes, and thrombocytopenia.

Step 2: involves assigning possible prototypical causes to the gap, according to 4 prototypical causes for gaps. For each gap, he followed Table 1, in which he assigned possible prototypical causes to the gap, according to 4 prototypical causes for gaps, and recommended responses to the gap accordingly (step 3).

Consequently, the diagnosis of PET with HELLP was established. Intravenous magnesium sulfate treatment was started, and an immediate cesarean section was done under general anesthesia (thrombocytopenia did not allow spinal analgesia). A healthy baby girl weighing 1615 g was born. Interestingly enough, as she woke up from anesthesia, she hardly complained of postoperative pain and explained that compared with her previous pain, which disappeared completely, the

current pain was nothing. In the days after the delivery, the patient's blood pressure and laboratory studies spontaneously returned to normal limits, further confirming the diagnosis of PET/HELLP.

Ethical approval was not necessary since we retrospectively analyzed the medical decision-making process of a single case.

3. Discussion

Frozen patient management can lead to a significant delay of the correct definitive intervention, be it surgical or pharmacological. The significance of this delay is especially important in time-dependent dynamic situations. At times, this may cost the life of either the fetus or the mother. In emergency departments, it may lead to a permanent brain damage which could have been prevented or continued fatal bleeding from an internal artery that was not considered. Interestingly enough, working according to protocols, as medical care includes today,^[5-14] is known as increasing the probability of frozen patient care.^[15]

In the present case, the first gap was the absence of physical or laboratory support to any pathological process. Had this gap been identified, we do not think it would have propelled different action. However, on the second admission, the mere fact that she chose to come back could have served as a leading gap, which, with proper re-thinking, might have prevented her discharge. On the third admission, not only the repetitive approach could have served as a key gap, but the mildly lowered thrombocyte count could have led to a different approach to the patient, should it had been identified as a gap. On her fourth admission, we were cognizant with the de-freezing approach and applied it to the gap of severe pain with all previous negative findings. The resultant decision to hospitalize and deepen the studies saved the patient from being sent home again and saved unnecessary risk to her health and life.

Medical education and training involves extensive studying of many diagnoses and treatment algorithms, which dictate patient management. Thinking is always focused on junctions where a specific call channels one to take a given future arm of the algorithm. Yet, at no point these algorithms say: "Please, stop, look backwards and verify the correctness of your thinking or actions." Hence, this attitude is not a front runner of teaching. Emphasizing cases like the one we present, and taking home the lesson, can help changing attitudes among physicians. We believe that adopting the "de-freezing questionnaire" as a routine adjunct for all medical activities would lead to a timely change of treatment line, which in turn will save lives and unnecessary suffer.

4. Conclusions

Ten months later, the sister of the same women came at her 31st week of gestation with the same complaints. Her clinical picture and course with the department was almost identical. When IBS

and JS recognized the fact that this is the sister, they trumpeted it. Yet, the department's head still had to go through an additional work-up, which included a negative gastroscopy, before her thrombocyte count sunk to 84,000/mm³, and persuaded him that she presents an atypical form of HELLP. After cesarean section under general anesthesia, her first awake remark was that the postoperative pain is nothing compared with her previous pain, which has disappeared altogether. We take the response to the sister's situation as evidence how previous fixed perceptions interfere with the ability to leap to an alternative track.

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