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STANDARD GUIDELINE SUBJECT:
Intrauterine Pressure Catheter

PURPOSE:
This guideline aids in the determination of when an intrauterine pressure catheter (IUPC) may be indicated, the safe implementation of an IUPC, in interpretation of IUPC electronic fetal monitor (EFM) strip and in the monitoring of an IUPC.

DEFINITIONS:
Amnioinfusion: An infusion of warmed or room temperature fluid (normal saline or Ringer's Lactate) into the uterine cavity, generally used to help alleviate repetitive fetal heart rate (FHR) variable decelerations.

Intrauterine Pressure catheter (IUPC): Internal, accurate measurement of the strength, length and timing of maternal contractions.

Extramembraneous placement: Placement of the catheter between the fetal membranes and decidua.

Montevideo units (MVU): A measure of pressure in the uterine cavity.

Umbilical cord prolapse: The presentation of the umbilical cord below or adjacent to the fetal presenting part.

IMPORTANT POINTS TO CONSIDER:
Indications for an IUPC include:

- When external methods are not providing a clear tracing of the uterine contractions,
- To determine the exact timing of FHR decelerations in relation to contractions (i.e. early decelerations vs late decelerations),
- To determine Montevideo units in the case of a labour dystocia,
- To determine if contractions are adequate in an augmentation or induction of labour,
- When oxytocin above 30 milliunits/minute is required during an augmentation or induction of labour,
- When augmenting or inducing a woman with a prior caesarean section scar,
- When amnioinfusion is required to treat FHR variable decelerations and/or
- Consider Group B Streptococcus status and treatment when rupturing membranes to establish an IUPC.

Requirements for an IUPC:

- Informed verbal consent from the patient,
- Ruptured membranes,
- Cervical dilation of at least 2- 3 centimetres,
- Knowledge of presenting part,
- Physician trained in insertion and
- Nursing staff trained in monitoring.

Contraindications to an IUPC:

- Placenta previa/Vasa previa – suspected or confirmed,
- Undiagnosed vaginal bleeding,
- Malpresentation,
- Active vaginal infections such as Genital Herpes, HIV, Hepatitis B/C and/or
- Chorioamnionitis – relative contraindication.

Insertion of an IUPC:

- Insertion is non–forceful into the uterine cavity,
- Is a sterile procedure,
- Placement should be laterally and away from the placenta and
- Ultrasound not used to guide placement.

Complications of an IUPC:

- Complications once correct placement has been accomplished are rare. Most complications come from improper placement :
    - Extramembraneous placement can (rarely) lead to placental abruption, laceration of the placenta uterine perforation or fetal vessel laceration. Insertion may have been dry (no fluid return through the catheter) or bloody (blood return through the catheter).
    - Uterine perforation – The patient may exhibit abdominal pain, signs and symptoms of bleeding. Insertion may have been dry or bloody. Contractions will not show an increase in pressure but a valsalva maneuver by the patient in the absence of a contraction may cause a spike in pressure if the uterus has been perforated.
    - Umbilical cord prolapse – May occur if the head is not well applied or moved out of the way during insertion.
    - Infection – 2x increase risk of maternal fever.

Prevention of complications of an IUPC:

- Maintain sterile technique,
- Gentle application (DO NOT use force),
- Stop if resistance is felt,
- Do not advance the introducer beyond the examiners fingers (just inside the cervix, prior to the fetal head) and
- Insert IUPC away from the placental site.

PROCEDURE:

1. Explain the procedure to the patient, including risks and benefits, and obtain verbal consent.
2. Insertion: to be completed by a trained physician only, nursing staff to provide assistance.

- Position the patient supine with a lateral tilt (usually left lateral).
- Physician to perform a vaginal exam to confirm dilation, rupture of membranes, presenting part and optimal positioning of the catheter.
- Turn on Electronic Fetal Monitor and monitor Fetal Heart Rate during insertion (either externally or internally).
- If the membranes are not ruptured: provide the physician with an amniotic hook in order to rupture the membranes.
- Remove catheter from packaging using aseptic technique.
- Ensure amnioport is vented by confirming filtered vented cap is in place on anmioport prior to giving the sterile catheter to the physician.
- The introducer and catheter are inserted to the tips of the examiners fingers, just beyond the cervix and before the fetal presenting part.
    - Gently advance only the catheter 10 -14 centimeters (cms), or to the first black mark on the catheter, into the amniotic cavity. The tip should be just beyond the fetal head. DO NOT force the catheter. If resistance if felt, withdraw the catheter and move the introducer to another location or angle and try again.
- Pause and allow fluid return through the catheter.
    - Flow of amniotic fluid through the catheter indicates appropriate placement.
    - Flow of blood indicates incorrect placement – may be extramembraneous, placental or in the umbilical cord. The catheter may be left insitu in certain situations – immediately check fetal and maternal well-being.
- Once amniotic fluid is seen, the catheter is advanced through the introducer another 45 cms, to the second mark on the catheter. The tip of the catheter should be in the uterine fundus.
    - If the catheter does not advance easily, or coils, fetal parts may be blocking the catheter. Withdraw the catheter and move the introducer to another location or angle and try again.
- Introducer is removed.
- Secure the IUPC to the patients' thigh with an appropriate securing device.
- Connect the catheter to the monitor cable. **NOTE**: When the catheter is zeroed depends on the manufacturer. Some catheters will be zeroed prior to connection, some after connection to the monitor – use the baseline button to zero as you do for the tocodynamometer (toco).
- Have the patient cough – a spike in pressure on the electronic fetal monitor should appear with correct placement.
- Baseline tone is between 7 – 25 mmHG with a term pregnancy. Baseline tone may be higher with preterm pregnancies.
- Physicians to order a range of MVU (i.e. increase oxytocin as per protocol until contractions between 200 – 250 MVU'S).

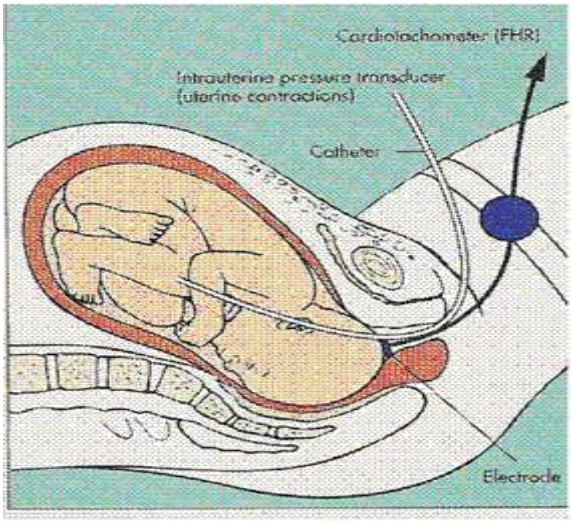
3. Monitoring: assess the patient every 15 minutes.

- Monitor contraction pattern and resting tone.
- Calculate MVU's by adding together the amplitudes of all contractions in a 10 minute window.
    - Amplitude = peak of the contractions minus the resting tone.
- MVU's are generally wanted in the 200 – 300 MVU range or 50 – 60 mmHG above baseline for inductions or augmentations (Physician to order the range they want).
- MVU's in normal labour are usually less than 250 MVU or 25-75 mmHg above baseline (except in second stage).
- Be aware that a rising baseline pressure may indicate increased intrauterine pressure (a risk for uterine rupture and/or placental abruption). **Note**: Use caution when zeroing the resting tone – palpate the fundus and ask the patient to ensure the uterus is soft prior to resetting the IUPC. In contrast to an external toco, the resting tone with an IUPC does not usually change due to positional changes of the patient.
- Patient may ambulate (if stable) with an IUPC in place – disconnect the catheter from the reusable cable when ambulating.
- Monitor FHR (rate, variability, accelerations, and decelerations).
- Monitor maternal vital signs as per standards.

4. Document in the integrated progress notes:
    - Indication for insertion,
    - Time of insertion,
    - Presence of amniotic fluid return, frank blood return or lack of return upon insertion,
    - Patient tolerance of the procedure,
    - Resting tone pre and post insertion,
    - Confirmation of cough spike and
    - FHR pre and post insertion.
5. If the IUPC is not working:
    - Disconnect catheter from the cable,
    - Physician to flush 10 – 20 mLs normal saline through the amnioport. and
    - Reconnect.

    OR

    - Disconnect catheter from the cable,
    - Physician to rotate, retract or advance catheter as needed and
    - Wait 15 seconds then reconnect.
6. Discontinuation of an IUPC may be done by the physician or the nurse:
    - Babies can be born with the IUPC in place.
    - When the IUPC is removed will depend on the reason for the placement:
        - If placed for contraction strength, the IUPC can be removed during the pushing stage and effective pushing is established.
        - If placed for FHR abnormalities, the IUPC may be removed once the fetal head is crowning or after delivery.
    - Prior to removal consider the following:
        - Ability to monitor the contractions (Palpation or External toco),
        - FHR - If late decels are occurring it might be prudent to leave it in as long as you can and
        - Pelvic adequacy - If it seems a tight fit, the IUPC may be removed and external monitoring commenced with active 2nd stage.



EQUIPMENT/SUPPLIES:

- One use, sterile intrauterine pressure catheter
- Appropriate reusable cable/connector
- Electronic fetal monitor
- Securing device (usually found in catheter package)
- Sterile gloves

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