Introduction:

We conducted a short-cut review of the medical literature in order to establish whether the insertion of central venous catheters (CVCs) under ultrasound guidance is safe in patients with deranged coagulation parameters. We did not intend to conduct a systematic review but rather collect the highest level of evidence relevant to this clinical question.

Methods:

Medline using the OVID interface 1950 to November week 2 2010
EMBASE 1980 to December week 2 2010

Medline: [(exp catheterization, central venous/) OR (central line.mp) OR (exp catheters, indwelling/) OR (exp catheterization/) OR (central lin$.mp) OR (CVC.mp)] AND [(exp blood coagulation disorders/) OR (coagulopathy.mp) OR (exp thrombocytopenia/) OR (coagulopath$ .mp) OR (exp international normalized ratio/) OR (INR.mp) OR (deranged clotting.mp) OR (abnormal clotting.mp)]

413 papers were found, 4 were relevant to the question
EMBASE: {[exp central venous catheter/ OR exp central venous catheterization/] AND [(exp blood clotting disorder/) OR (exp international normalized ratio/) OR (exp blood clotting/) OR (thrombocytopenia/)]} AND [(complication/)].

257 papers were found. Only one was relevant to the question but that was a duplicate from the search above.

Both search strategies were limited to English language, human and adults. The relevant studies are tabulated below.

Discussion:

The evidence seems to suggest that insertion of CVC lines does not require correction of haemostatic abnormalities beforehand. Rates of haemorrhage and other complications appear to be closely related to the level of experience of the physician rather than the defects of haemostasis.

Conclusion:

Ultrasound-guided central line insertion in patients with coagulopathy is safe if performed by an experienced operator.

References:


Results:

<table>
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<tr>
<th>Author, country, date</th>
<th>Patient group</th>
<th>Study type</th>
<th>Outcomes</th>
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<tr>
<td>F. Tercan et al., Turkey 2007</td>
<td>133 CVC insertions in 119 patients with disorders of haemostasis (platelets ≤50x10^9/L, INR ≥1.5, APTT ≥50 alone or combined)</td>
<td>Prospective study</td>
<td>Number of attempts, success rate, complications within 24 hours, record of single or double-wall puncture</td>
<td>Average number of punctures 1.01 (range 1-3) Success rate 100% (1% puncture 95.5% and 2.5% 1.5%) Single-wall puncture 89.5%, double-wall puncture 10.5% 6% rate of minor complications (naming, haematoma) Association was found between high INR and haematoma rate (p=0.05) Platelet count, APTT, number of puncture, diameter of line not associated with haematoma (p=0.05)</td>
<td>Performed by interventional radiologists. 5 patients lost to follow-up</td>
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<tr>
<td>K. Weigand et al., Germany 2009</td>
<td>196 patients, 65 with disorders of haemostasis (PT/50% or INR ≥1.5, platelets ≤50x10^9/L) U.S.-guided CVC insertion. Excluded patients who had received FFP/RBC/platelets within 24 hours</td>
<td>Prospective study</td>
<td>Complication defined as &gt; fibrin 1.5g/dl drop 24-36 hours post-procedure Compared mean platelet count between the group with fibrin drop and those with no decline. Similar for INR, PT</td>
<td>No statistical difference for platelets, PT or INR groups (p=0.024, 0.164 and 0.363 respectively). A subgroup analysis of combined derangements showed no statistical difference either</td>
<td>Number of patients with extreme values too low to detect statistical significance</td>
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<td>P. Della Vigna et al., Italy 2008</td>
<td>157 patients with disorder of haemostasis, 239 CVC insertions increased risk: PT/APTT 1.2x normal and/or ptt≤158.10^9/L. High risk: PT/APTT 2.2x normal and/or ptt≤58.10^9/L</td>
<td>Retrospective study</td>
<td>Number of pases Number and extent of complications</td>
<td>122 CVCs inserted in haemostatic disorders (65 in high risk, 77 increased risk patients) No arterial puncture, no complications, no correction of coagulation parameters recorded</td>
<td>Experienced radiologists. Retrospective study. Oncology patients.</td>
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