The Target Zone for Vascular Access – An Evidence Based Approach

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Femoral Artery Access in the New Percutaneous Technologies Era:
Under-appreciated
Under-investigated
but
Over-represented in Complications
## Conflict of Interest Statement

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<thead>
<tr>
<th>Company</th>
<th>Role/Support</th>
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<tr>
<td>Abbott Vascular</td>
<td>Scientific Advisory Board</td>
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<td>Research Grant Support</td>
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<td>Lecture Honoraria</td>
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<td>St. Jude Medical</td>
<td>Lecture Honoraria</td>
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Seldinger technique - 1953

Very little literature considering vast experience
55 Years Later

Courtesy Dr. John Eidt, UAMS.
Complication Rates

Chandrasekar et al  CCI 2001
Usual Approach to Vascular Access
Landmarks Used for Femoral Puncture

Skin Crease

Maximum Pulse

Bony Landmarks

Skin Crease Most Common

Inguinal Crease

Cannes - 2008

New Jersey
“Normal” Anatomy

Misconceptions Despite 50 Years Experience
Femoral Artery Anatomy: A Prospective Study

- 200 consecutive patients
- All undergoing coronary angiography
- Femoral angiography at end of procedure
- Quantitative angiography
Femoral Head and the CFA Bifurcation

Number of patients:
I: 111
II: 44
III: 34
IV: 8
V: 3

n=200
Common Femoral Artery – Classic Measurements

- From top of femoral head to femoral bifurcation
- Does not take IEA into consideration
- Does not consider implications of CFA stick above bifurcation, but below femoral head
Target Zone
TYPE 1

Target Zone

Centerline

IEA

BIF
Cumulative Probability of Being Below FH or Puncturing Bifurcation Vessel

Probability of Being Outside Target Zone (%) vs. mm from Femoral Head Centerline

Below Above

N=334
Cumulative Probability of Being Above Bottom Sweep of IEA

Below
Above

mm from Femoral Head Centerline

Probability of Being Outside Target Zone (%)

N=334
Cumulative Probability of Being Outside Target Zone

Below Above

mm from Femoral Head Centerline

Probability of Being Outside Target Zone (%)
FH Centerline
Cumulative Target Zone
BIF
Recommended Approach
Optimal Access to Prevent Complications: A Quantitative Assessment of Puncture Into the Femoral Target Zone

Zoltan G. Turi, Brian J. McEniry, Michael N. Turi, Cooper University Hospital, Robert Wood Johnson Medical School, Camden, NJ

We have previously described a target zone (TZ) for vascular access, defined as that portion of the common femoral artery below the lowest sweep of the inferior epigastric artery (IEA) and above the femoral bifurcation (BIF) or bottom of the femoral head (BFH) [whichever is higher]. We have established that a cumulative target zone (CTZ), located between 5 and 14 mm below the femoral head centerline results in the lowest probability of access outside the TZ. We sought to assess the location of femoral punctures when the operator utilized fluoroscopy during vascular access to enter the TZ.

BACKGROUND

METHODS

Using quantitative femoral angiography, we evaluated the location of femoral sheath placement in 187 consecutive patients. We compared puncture location from the centerline of the femoral head to the inferior sweep of the IEA, the BIF and the BFH. Since the location of the BIF and IEA is not known prior to sheath placement and femoral angiography, we also compared femoral puncture location to the CTZ.

RESULTS

Puncture above the IEA occurred in 2.7% of patients, below the BIF in 3.7% and below the BFH in 2.1%. The CTZ was the location of puncture in 46.8% of patients. Puncture above the centerline, the location most likely to result in retroperitoneal hemorrhage, occurred in 7.4% of patients.

CONCLUSION

Using fluoroscopy to guide femoral artery access results in a relatively low rate of puncture outside the TZ, and may contribute meaningfully to a decrease in overall femoral access site complication rates.

DISCLOSURE

Dr. Z. Turi receives research support from Abbott Vascular and is a member of the Abbott Vascular Scientific Advisory Board.
• Diagnostic cath – no heparin
• No fluoroscopy
• Inguinal crease

• PTCA – heparin + IIb/IIIa
• Fluoroscopy
• Ignored inguinal crease
Better Technique ⇒ Better Result