A great fiducial marker for Prostate

- Minimally invasive
- Instant stability
- Great visibility
Minimally invasive

Industry leading thin needle

Benefits
- Reduce implantation time
- Reduce patient discomfort
- Reduce complications from implantation

17G, Ø1.47mm

18G, Ø1.27mm

22G, Ø0.70mm

Needles typically used for traditional markers

Needle used to implant Gold Anchor in prostate

Testimonial – Transrectal implantation

“We have not seen any complications from the use of Gold Anchors. On the contrary, the application process is much easier than for other fiducial markers, since with Gold Anchor we do not have to use local anesthesia – giving local anesthesia would be more painful than implanting the fine needle marker.

We have between 5-8 patients per week and have never had any infections since we started using Gold Anchors in 2009. When we started with gold markers, we used prophylactic antibiotic, Ciprofloxacin 500 mg twice daily, for three days before implantation, but since autumn 2010 we use two Bactrim Forte pills as a single dose two hours before the implantation.”

Watch the testimonial on video

Reduce implantation time

We generally recommend transrectal implantation of Gold Anchors. With Gold Anchor this is a low risk procedure that does not require anesthesia. Three Gold Anchors can typically be implanted by the doctor in less than five minutes.

If you prefer to implant the markers transperineally you can also avoid local anesthesia by using an EMLA patch 30 minutes before implantation.

Reduce patient discomfort and complications from implantation

Some complications after transrectal implantation

Rectal bleeding

Hematuria

Fever


Intensity of pain during transrectal implantation in prostate (not showing those answering “no pain”).

17G: 1.2x3 mm markers without anesthesia

18G: 1x5 mm markers with local anesthesia

22G: Gold Anchor without anesthesia

0 = no pain

5 = worst possible pain

Share of patients (n=135)

Share of patients (n=229)

Share of patients (n=362)

5 5 10

9

4 4 8

7

3 3 6

5

2 2 4

3

21 1 1

10% 0% 0% 0% 10% 10%

20% 20% 20% 30% 30% 30%

Intensity of pain during transrectal implantation in prostate (not showing those answering “no pain”).

Share of patients (n=135)

Share of patients (n=229)

Share of patients (n=362)
Instant stability

Multiple cut-outs allow the marker to fold
The marker is passive and will form different shapes depending on implantation technique.
• Line shaped markers are useful for detecting plastic deformations and tilting.
• Completely folded markers are suitable for systems with automatic marker detection.

Benefits
• Anchors directly
• Trust each marker
• Save lead time and travel

Trust each marker
The stability of the marker in the tissue can also be verified by comparing the marker shape over time. One Gold Anchor marker can therefore be sufficient in selected cases where corrections for rotation and tilting are not performed. Preserved shape acts as a proof of no migration.

Note: Traditional markers are more likely to migrate and many centers therefore implant at least three traditional markers to be able to detect if any of those markers have moved (by looking for a potential change in the distance between the markers).

Save lead time and travel
With Gold Anchor there is no need to wait the usual 7–21 days before dose planning. The thin Gold Anchor needle, that causes minimal bleeding and swelling, in combination with the strong tissue attachment of the marker, makes it possible to proceed with CT and/or MR for dose plan on the same day as implantation.

Note: Most centers that use traditional markers send their patients home for 7-21 days after implantation to allow the traditional markers to “settle in”, i.e. to allow the potential bleeding and swelling subside to reduce the risk that the traditional markers migrate in the tissue.
Great visibility

Thin marker in unique material
The marker is only 0.28 or 0.40 mm thick, which improves the surface-to-volume ratio.
The marker is made of an alloy of pure gold and 0.5% pure iron for improved MR visibility.

Benefits
- Clearly visible on kV and ultrasound
- Ideal for proton therapy
- Reduce CT artifacts
- Easily register CT and MR images

Reduce CT artifacts
The small Gold Anchor markers cause limited CT artifacts.
To further minimize artifacts the Gold Anchor markers can be implanted with a line shape.

Clearly visible on kV
Gold Anchor has been designed for use with kV imaging. The kV x-ray is heavily attenuated whenever it passes through a material of high density, such as gold. A high kV, approximately 130 kV, should be used to fade away the skeleton structures.

Benefits
- Clearly visible on kV and ultrasound
- Ideal for proton therapy
- Reduce CT artifacts
- Easily register CT and MR images

Easily register CT and MR images
Ball shaped Gold Anchors are clearly visible on ordinary T1-weighted MR sequences (see image to the right).
With Balanced Fast Field Echo (bFFE) sequences you can even visualize line shaped 0.4 mm diameter Gold Anchors.

Ideal for proton therapy
The thin Gold Anchor marker causes minimal dose perturbation.
The film measurements to the right show dose perturbation downstream of the markers with the markers oriented perpendicular to the beam axis near the end of the SOBP (Spread-Out Bragg Peak). The dose is normalized to an unperturbed region.

Benefits
- Clearly visible on kV and ultrasound
- Ideal for proton therapy
- Reduce CT artifacts
- Easily register CT and MR images

Reduce CT artifacts
The small Gold Anchor markers cause limited CT artifacts.
To further minimize artifacts the Gold Anchor markers can be implanted with a line shape.

Ball shaped Gold Anchors can often be identified on T2-weighted MR sequences. You can thereby detect and adjust for any potential organ movement between MR sequences.

Source: Z. Uludag, "Investigation of dosimetric effects of radiopaque fiducial markers for use in proton beam therapy with film measurements and Monte Carlo simulations"
Product family

Four different markers

<table>
<thead>
<tr>
<th>Needle</th>
<th>Diameter</th>
<th>Length</th>
<th>Markers</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA200X</td>
<td>Ø 0.28 mm</td>
<td>10 mm</td>
<td>Ø 0.28 mm (10 mm)</td>
</tr>
<tr>
<td>GA200</td>
<td>Ø 0.40 mm</td>
<td>10 mm</td>
<td>Ø 0.40 mm (10 mm)</td>
</tr>
</tbody>
</table>

Three different needles

<table>
<thead>
<tr>
<th>Needle</th>
<th>Diameter</th>
<th>Length</th>
<th>Markers</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA200X</td>
<td>0.9 x 200 mm</td>
<td>20G x 7.9&quot;</td>
<td>0.9 x 200 mm (20G x 7.9&quot;)</td>
</tr>
<tr>
<td>GA200</td>
<td>0.7 x 200 mm</td>
<td>22G x 7.9&quot;</td>
<td>0.7 x 200 mm (22G x 7.9&quot;)</td>
</tr>
<tr>
<td>GA150</td>
<td>0.5 x 150 mm</td>
<td>25G x 5.9&quot;</td>
<td>0.5 x 150 mm (25G x 5.9&quot;)</td>
</tr>
</tbody>
</table>

Recommended products for prostate

- Linac with kV imaging: GA200-10, GA200-20 or GA200-10-B implanted with ball shape, GA200-10-B or GA200-20-B implanted with line shape.
- CyberKnife tracking: GA200-20 or GA200-10-B, implanted with ball shape.
- MVCT (TomoTherapy): GA200-20-B, implanted with ball shape.
- Proton therapy: GA200-10 implanted with ball shape, Any GA200 product implanted with line shape.

Implantation technique

We recommend transrectal implantation with the products mentioned above. For transperineal implantation some doctors prefer the stiffer GA200X needle, e.g. GA200X-10 instead of GA200-10.

Naslund Medical AB

Naslund Medical AB is a privately held medical products company focused on the improved management and care of patients receiving radiation therapy. As the pioneer and leader in developing new technology for fiducial markers, Naslund Medical markets Gold Anchor worldwide. Gold Anchor enables quicker and more effective radiation therapy treatment with increased patient safety. Naslund Medical is based in Sweden with a subsidiary in the U.S. and contracted distributors on a global level. Naslund Medical is certified to SS-EN ISO 13485:2012 and according to the Directive 93/42/EEC on Medical Devices, Annex II, Full Quality Assurance System.

Gold Anchor has been invented and developed by Ingemar Naslund, M.D., Assoc. Prof., for 20 years head of the Division of Radiation Therapy, Radiumhemmet, Karolinska University Hospital, Stockholm, Sweden, where he was one of the inventors of the SBRT technique in 1991.

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CE Marked, FDA Cleared, International Patents, New International Patents Pending.