



Standardization of the Terminology Used in FUE Part II

Characteristics of the Techniques

Rotating Extraction: The punch is rotated a full repetitive 360-degree cycle during penetration of the skin. This is usually done by motor.

Oscillating Extraction: The punch is rotated back and forth through different arcs and repetitions per minute (RPMs) during penetration. This may be done by hand or by a motor.

Rotating and Oscillating Extraction: When rotation followed by oscillation is employed during penetration of the punch. Rotational speed, arc of rotation, ramp (amplitude from starting position to ending position) of rotation, ramp of arc, and duration of each individual cycle may be controlled.

Step Methods: These methods relate the steps that need to be applied, with a punch or other cutting tool, to release the graft from the surrounding tissue. All methods take a last final step common to all the techniques, which is the collection of the follicle with forceps or suction:

- *One Step Method* uses an extraction punch that is inserted to the desired depth in a single incision using a rotational force, oscillating force, axial force, or combination of rotation and oscillation forces.
- *Two Step Method* uses a sharp punch to first score the skin using a rotational, oscillating, or axial action. Then either the same sharp punch or a different punch is inserted through the epidermis via the same incision to the desired depth using a rotating or oscillating action. The second punch may be a different sharp punch or a dull punch.
- *Three Step Method* uses a sharp punch to score the skin followed by a sharp or unsharpened punch to penetrate as in the two-step method. Then a needle or other sharp device is used to cut the graft free at the base while traction is applied with a forceps to remove the graft.

Sequential Method: The surgeon holds the punch and the forceps in both hands at the same time. The grafts are first cut with the punch in one hand and then removed with the forceps held in the other hand, one graft at a time and in rapid sequence.

Coring Method: A sharp punch is inserted with a single axial force applied along the axis of hair growth without rotation or oscillation. Following the initial axial force a tangential force may be applied to help loosen the graft prior to removal with forceps.

Open Method: Also called Lift and Look. The skin is cut using a punch to first score around the graft. Next, the cluster is pulled from the surface of the skin so that the surgeon can see the direction of hair growth and splay. Then a series of maneuvers may be used to dissect down along the follicular unit. The process may be assisted using suction to clear the visual field.



Sharp Dissection: This is when a sharp punch is inserted along the course of the follicle to facilitate its extraction.

Dull Dissection: This is when an unsharpened punch is inserted along the course of the follicle to facilitate its extraction. The dull dissection uses a dull punch with an unsharpened edge that has a wide wall to allow a wedge-like configuration with the aim of separation of the follicles from the surrounding tissue.

Pulling: This is defined as the anterior traction used for the removal of the graft, after it has been punched. Grafts may be pulled with a one-hand pull with a single forceps, a two-hand pull with two forceps, with an ATOE (see below), or with suction.

Scoring: This is a superficial cutting of the epidermis and dermis with a punch, to produce a superficial circumferential or semicircle incision around a follicular grouping.

Depth Control: This refers to the utilization of different accessories on or around the punch to precisely control the depth to which the punch can be inserted.

Limited Depth Extraction: The punch is inserted only to a depth of 1.8-3mm, but typically 2-3mm, in order to release the follicles from the surrounding tissue with the help of forceps. Limited depth extraction minimizes follicle transection.

Full Depth Extraction: The punch is inserted the full length of the follicle (from 4 to slightly more than 6mm depending on the patient) to meet or exceed the level of the bulbar region of the follicular group and completely free the follicle(s).

Follicle Distortion: This is the physical movement of the follicle in reaction to the axial and tangential forces resulting from the physical process of follicular unit extraction.

Axial Force: This is the force applied parallel down the centreline of the hair follicles during graft extraction. When the force is evenly distributed, the force is concentric. When the force is unevenly distributed, the force is termed eccentric. Because the inferior margin of the punch touches the skin first due to angle of hair growth, the force is often greater on the inferior aspect of the tissue during graft removal. This uneven force often causes follicle displacement.

Tangential Force: This is the force applied through rotation or oscillation of a punch around a follicle or group of follicles.

Donor Tension or Traction: Tension may be applied to the donor area to stabilize the fluidity of the tissue. Tension may be applied by a variety of means including the following: tumescence, clamps, or manual or stretching forces applied through other means such as tensioners or stapling a latex material from one side of the scalp to the other.

Bulls Eye: This is when the follicles being extracted within a follicular group are perfectly centered in the punch during its insertion.



ATOE (Aide to Extraction): This is a specialized forceps with specialized design, created to facilitate a rapid extraction of the previously dissected grafts.

Delay in Extraction: This is the temporal difference between the time when the punch incises the grafts using a single step or multiple step process and the time when the grafts are physically removed from the donor area. Following the delay in extraction, the grafts may be placed in a holding solution or reinserted into the scalp immediately.

Follicle Depth: Defined by the distance from the surface of the skin to the full length of the follicle below the hair bulb.

Time Out of Body: This is the quantity of time between the removal of the graft containing one or more than one follicles from the donor area with forceps or suction and the reinsertion of the graft into the recipient area. The graft may go into a holding solution first or it may be immediately placed into a recipient site.

Punch

Handle: The tool by which the punch is held, carried, and depth controlled. There are some different handles for the manual FUE technique, the most popular are the Versi handle and the CIT manual punch handle.

Cannula Punch: This is a cylindrical punch usually made of stainless steel.

TiN Coated Punch: This is a punch whose tip is coated with titanium nitride (TiN) so that the punch has a characteristic gold colored tip. This improves the lifespan of a sharp punch.

Serrated Punch or Wave Punch: This is a punch with a serrated cutting edge that offers many small points of contact with the skin. It can also be called a triple wave punch (Rassman).

Serrounded Punch: This is a very sharp, thin walled punch with serrated tips that reduce the surface area in contact with the skin with the aim to diminish the amount of frictional force (Cole Instruments).

Classification of Punch by Diameter :

- *External Diameter of the Punch* is the diameter from the external surface on one side of a punch to the external surface on the opposite side of the punch.
- *Internal Diameter of the Punch* is the diameter from the internal surface on one side of a punch to the internal surface on the opposite side of the punch. Some punches have an internal diameter that is larger at the cutting edge and narrower in the body of the punch.
- *Cutting Edge Diameter of the Punch* is the diameter from the cutting part of the punch (end of the bevel) on one side of the punch to the cutting part on the opposite side of the punch. For the same external diameter, the cutting edge diameter may vary depending on the position of the bevel. The cutting edge diameter is the main measurement of the punch and it should be used as the main point of reference for all companies that manufacture punches. Currently, the most widely used reference is, incorrectly, the inner diameter. The cutting edge diameter is equal to the external diameter in an inside bevel punch and is equal to the internal diameter in an outside bevel punch, and is between the internal and external



diameter in a center bevel punch. Attention should be paid to the specifics of the size of the punch as different manufacturers vary in their production standards.

Classification of Punch by the Cutting Edge:

- *Outside Diameter Punch* (or inside bevel punch) has the cutting edge of the bevel located on the external surface of the wall of the punch.
- *Middle Diameter Punch* (or middle bevel punch) has the cutting edge of the bevel located on the middle of the wall of the punch. The location of the cutting edge is not always EXACTLY in the middle wall of the punch.
- *Inside Diameter Punch* (or outside bevel punch) has the cutting edge of the bevel located on the inside face or at the inner part of the wall of the punch.

Classification of Punch by the Diameter of the Cutting Edge:

- *Small Punch* has a cutting edge diameter that is equal to or less than 0.8mm.
- *Medium Punch* has a cutting edge diameter that is greater than 0.8mm and less than 1mm.
- *Large Punch* has a cutting edge diameter that is equal to or greater than 1.0mm.

Classification of Punch by the Sharpness of the Cutting Edge:

- *Sharp Punch* has a sharpened cutting edge.
- *Dull Punch* has an edge that is not sharpened.

Donor Area

Safe Donor Area: The portion of the scalp that contains follicles presumed to be the permanent hair within the donor area. This presumed permanent “safe donor area” is based on years of experience in hair restoration by a number of physicians, but it is impossible to accurately define this surface area in all patients. In some individuals, this surface area may be greater, while in others, it may be less. Furthermore, there is no guarantee that all follicles within a “safe donor area” are permanent. This is a very difficult area to define, especially in young patients.

Donor Area Template: This is a template that allows the margins of the presumed safe donor zone and extraction zones to be marked.

Donor Area Regions: This defines the zones of the safe donor area from which grafts should be extracted:

- *Major Donor Regions* are within the presumed safe donor zones of the occipital and temporal regions.
- *Minor Donor Regions* are zones of secondary use and include the nape of the neck and areas located inferior to the major donor regions. Hair in these regions is less reliably presumed to be in the safe donor zone in patients who do not have extreme degrees of hair loss. Individuals with higher degrees of hair loss will often lose hair in these regions as they age. Often hairs are finer in these regions and contain a higher percentage of hair in the telogen phase.
- *Additional Donor Regions* include the temporal areas in front of the ears, the supra-auricular areas, and lateral humps.