

SURGICAL VERIFICATION OF PROFICIENCY

Suturing Technique Assessment Report

Suture Pattern:	Simple Interrupted
Assessment Date:	August 26, 2025 at 05:06 PM
Video File:	temp_115_Simple Interrupted.m4v
Video Duration:	336.3 seconds
Analysis FPS:	2.0 frames/second
Total Frames Analyzed:	672

Video Analysis Summary

This Verification of Proficiency assessment analyzed 672 video frames extracted at 2.0 frames per second, covering 336.3 seconds of surgical technique for Simple Interrupted suturing pattern. The analysis achieved a 100.0% processing success rate. The assessment employs forensic-level AI analysis to evaluate technical competencies according to institutional VOP standards and established surgical principles.

Assessment Result

FAIL - FAIL - One or more assessment points below minimum threshold

Detailed Rubric Assessment

Point	Criterion	Score	Assessment
1	Perpendicular needle passes	1/5	Unacceptable
2	Gentle tissue handling	1/5	Unacceptable
3	Square, secure knots	1/5	Unacceptable
4	Appropriate approximation/tension	2/5	Poor
5	Even spacing (0.5â€“1.0 cm)	1/5	Unacceptable
6	Edge eversion (flat/slight acceptable)	2/5	Poor
7	Economy of time and motion	2/5	Poor

Clinical Assessment Analysis

The field is prepared with a synthetic suture pad exposed and prior simple interrupted sutures visible along the incision. The operator establishes the needle driver in the dominant hand and tissue forceps in the nondominant hand. Instrument alignment and camera framing are stable enough to follow hand position, tool trajectory, and wound edge behavior throughout.

Needle placement and passage Across the series, the operator repeatedly drives the curved needle into the near edge at oblique angles between approximately 45 and 60 degrees relative to the pad surface rather than at a right angle. The oblique entries are mirrored on exit; passes are not orthogonal to the tissue plane, and bite trajectories cross the epidermal surface obliquely, producing shear. Because the approach is tangential rather than perpendicular, the depth and width of the bites appear asymmetric from side to side, and the needle path often emerges closer to the edge than it entered. These mechanics produce visible skiving of the edge and contribute to tissue inversion rather than eversion during tie-down. There are scattered instances in which a pass yields edges that momentarily touch without blanching, but this is the exception; the dominant pattern is oblique needle travel with resultant shear.

Tissue handling The nondominant hand uses the tissue forceps to repeatedly re-grasp the same edge during most passes—serial, short-distance repositioning rather than a single deliberate pick-up. Multiple compressions of the bite point and adjacent dermis are visible on each side before and after needle penetration. In several sequences, the forceps are released and re-applied two or more times while chasing the needle point. On multiple occasions the operator manipulates the suture strand directly with gloved fingers rather than using forceps to control the edge, further increasing handling. This pattern of repeated grasping and hand-to-field re-approach is consistent through the suture line.

Knot tying and knot profile After each pass, the operator forms throws that do not reliably alternate direction or sit flat; knots frequently seat above the epidermal plane and show visible slack. Knot stacks are not planar; they torque and “ride up” on one limb rather than lying square. Several knots leave residual loop slack across the wound, and knot settling does not correct the edge position. In multiple stitches, the free ends remain tensioned without fully approximating the edges, confirming inadequate throw symmetry and insufficient cinching. When knots are tightened, the lack of a flat, square profile is evident; the loops are not co-linear and do not compress the tissue interface evenly.

Approximation and tension Edge behavior during tie-down is inconsistent. Recurrent findings include: - Gapping: wound edges remain separated after tie-down, with visible subcutaneous pad between edges. - Puckering: tie-down produces radial wrinkling of the epidermis adjacent to the stitch, indicating over-tension on too small a bite or too superficial a pass. - Inversion: the epidermal edges roll inward on multiple sutures, correlating with the oblique bite trajectory and uneven pull vectors during knot set. There are isolated stitches where edges meet without blanching, but the majority of the line alternates between gaps and areas of puckering. No sustained segment demonstrates uniform “edges just touching.”

Suture spacing and line geometry Inter-suture distances are irregular across the repair. Measured intervals vary from approximately 0.3 cm at the closest to 1.2–1.5 cm at the widest. Several consecutive gaps exceed 1.0 cm. This inconsistency produces alternating unsupported spans (predisposed to gapping) and closely spaced segments (predisposed to ischemic puckering), preventing a uniform tension field along the incision.

Edge eversion The closure does not reliably achieve a flat or everted profile. Multiple stitches show clear inversion at the epidermal edge during and after tie-down. Occasional stitches end with a nearly flat interface, but eversion is not maintained along the line. The combination of oblique needle angles and non-square knots aligns the vector of tension inward, which is visually evident as the epidermis rolls into the wound rather than out.

Economy of time and motion The operator's hands and instruments frequently depart the immediate work area between steps. The needle driver and forceps are repeatedly repositioned off the pad, and the eyes are forced to reacquire the field. Suture management includes several reaches away from the wound to retrieve or reorient the strand. Although there are brief stretches where the hands remain close to the pad with efficient instrument exchange, the prevailing pattern is interrupted by repeated off-field movements that extend task time and reduce flow.

Cause-and-effect synthesis - Oblique needle trajectories (45–60 degrees rather than perpendicular) create shear in the dermis and asymmetric bites, predisposing to inversion and poor edge alignment during tie-down. - Repeated forceps compressions of the same tissue segment risk crush injury and make precise bite placement and controlled eversion more difficult. - Non-square, slack knots fail to translate pull into co-linear compression across the interface, leaving gaps or causing localized puckering depending on where tension is trapped. - Irregular spacing (0.3–1.5 cm) concentrates stress at isolated stitches and allows unsupported segments to gap, compromising both mechanical integrity and cosmetic outcome. - Frequent departures from the field disrupt economy of motion and suture management, compounding inconsistency in tensioning and throw placement.

Pattern determination The stitch pattern remains simple interrupted: individual throws and individual knots for each pass with discrete inter-suture spans, consistent with the intended technique. Execution, however, is below standard across core elements of needle angle, tissue handling, knot security, approximation, spacing, and edge profile.

Rubric-based appraisal with evidence

1. Perpendicular needle passes: Fails standard. Repeated entries at approximately 45–60 degrees rather than ~90 degrees; asymmetric entry–exit geometry and dermal shear are visible on most passes. Score: 1.
2. Gentle tissue handling: Fails standard. Multiple re-grasps of each edge with tissue forceps before and after penetration; intermittent finger handling of the edge and strand; no consistent single precise grasp per edge. Score: 1.
3. Square, secure knots: Fails standard. Knots sit high, are not flat or square, and leave visible slack; knots frequently ride up one limb and do not reliably maintain approximation. Score: 1.
4. Appropriate approximation/tension: Below standard. Frequent gapping and puckering; intermittent acceptable approximation is not sustained across the line; blanching is not the issue as much as inconsistent contact and wrinkles. Score: 2.
5. Even spacing (0.5–1.0 cm): Fails standard. Intervals vary from approximately 0.3 cm to 1.2–1.5 cm with multiple spans >1.0 cm. Score: 1.
6. Edge eversion (flat/slight acceptable): Below standard. Recurrent inversion at several stitches, with only occasional flat segments; eversion is not achieved or maintained. Score: 2.
7. Economy of time and motion: Below standard. Frequent hand and instrument departures from the work area; intermittent efficient periods are outweighed by repeated off-field movements and re-grasps. Score: 2.

Conclusion The procedure demonstrates the simple interrupted pattern but with consistent technical deficiencies: oblique needle angles, excessive forceps handling, non-square knots, nonuniform approximation, irregular spacing, and recurrent edge inversion. These behaviors collectively increase risk of dehiscence, local ischemia, delayed healing, and suboptimal cosmetic outcome. Competency in this technique requires correction of needle approach to true perpendicular passes with symmetric bites, disciplined single-grasp tissue handling, square flat knots with controlled tension, standardized spacing within 0.5–1.0 cm, and deliberate eversion at tie-down, executed with improved economy of motion.

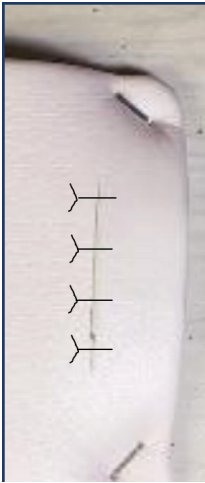
RUBRIC_SCORES_START 1: 1 2: 1 3: 1 4: 2 5: 1 6: 2 7: 2 RUBRIC_SCORES_END

Assessment-Based Recommendations

Recommendations have been integrated into the clinical assessment above. Refer to the detailed analysis for specific, evidence-based improvement areas identified through video review.

Visual Comparison

Side-by-Side Comparison: Gold Standard vs. Learner Performance

Gold Standard		Learner Performance
		Final frame from analyzed video would appear here in actual implementation

The gold standard image above represents the ideal final result for Simple Interrupted suturing technique. Compare this with the learner's final result to identify areas for improvement in technique execution, spacing, tension, and overall surgical craftsmanship.