TEMPLATE

RQ [##]: Is a routine “second-look” debridement at 48 hours mandatory in severe Grade III or crush injuries?

Section 1: Background (<300 words):

- The most common approach to complex open fractures (Gustilo Anderson Grade III) is an irrigation and debridement done by an orthopedic surgeon as an urgent procedure, temporary stabilization of the fracture, usually with external fixation and coverage of the wound with a negative pressure device or saline soaked gauzes. Then a second look 48 to 72 hours later with the goal of definitive internal fixation and wound closure, this is usually done together with a plastic surgeon to perform the definitive soft tissue coverage and wound closure.
- Currently the evidence is scarce and there are some guidelines (NICE and BOA / BAPRAS) that promote orthoplastic approach, in which initial management of a complex open fracture (long bones, hind foot and mid foot) should be done by a team of a senior Orthopedic Trauma Surgeon and a Senior Plastic Surgeon in specialized centers. The initial irrigation and debridement should be done by these two specialist so they can decide on the management plan. Definitive soft tissue coverage or closure should be done within 72 hours of injury if it cannot be done at the time of initial irrigation and debridement. Definitive fixation of the bone should be done only when it can be immediately followed with definitive soft tissue coverage.
- Gaps and clinical evidence: the fix and flap (orthoplastic approach) can only be done in centers where both specialists are working on the trauma team and be able to follow the guidelines, most complex open fractures are initially treated at centers where plastic surgery is not available; therefore the initial management of most of these injuries is done by an orthopedic surgeon, usually with temporary external fixation and subsequent debridement until soft tissue coverage is available or the patient is sent to another facility.

Section 2: Data extraction table

For each included study: Author/Year, Study Design, Sample Size, Population, Intervention/Comparator, Key Outcomes, Results, and Follow-up duration.

Example table template (can be edited as per the question)

S.no	Author, year of publication, Country	Study Design	Sample Size (add individually for each group if multiple groups compared)	Study population (Inclusion and exclusion criteria)	Groups compared	Results
1	Powell-Bowns et al, 2024, Scotland, UK	Review				This article is a review of Timing of Debridement: when to do it and who should perform it. More recently, studies have proposed an alternative approach, with initial debridement and temporary fixation followed within 48 hours with a further debridement, definitive fixation and flap cover with a combined orthoplastic team.

2	Rozell JC et al, 2017, United States	Review				A review on Timing of operative debridement in open fractures. They recommend in cases of gross contamination or venous soft tissue envelope, delayed wound closure allows for multiple debridements and reassessment of the wound. There are no objectives guidelines to make this decision and it depends on surgeon experience. They quote Lenarz et al (2010, JBJS) in which they took cultures after every I&D (48 hours) and they close the wound once the cultures are negative
3	Hussey M et al, 2011, United States	Review				A review on Principles of wound closure. Concerning the question of second look debridement: in many cases a new debridement is needed to achieve a stable wound that is ready for closure. Sequential debridement is needed when tissue viability and the extent of debridement are nor predictable.

4	Guthrie HC et al, 2011, United Kingdom	Review				Historical origins and current concepts of wound debridement. They mention: the complexity of the wound, degree of contamination and the evolving nature of tissue viability as factors for serial debridements. They quote a study (Kumar AR et al, Plast Reconstr Surg 2009) with 46 lower extremity flap reconstructions that needed on average five debridements before soft tissue reconstruction.
5	Ryan SP et al, 2013, United States	Review				Controversies in initial management of open fractures. Type III open fractures require a repeat debridement at 48 - 72 hours after initial debridement. To support this they quote Pollak A et al (JBJS 2000) the LEAP study on complex type III open tibia fractures. Finally they recommend closure within 7 days once the soft tissues have stabilized and all nonviable tissues have been removed.
6	Lee N et al, 2014, United Kingdom	Review				Classification and management of acute wounds and open fractures. Recommendation: in the presence of heavy contamination, the wound must be re-inspected after 48 hours to evaluate if further debridement is necessary and soft tissue coverage can be planned.

Section 3: Results summary write-up (upto 500 words)

On heavy contaminated wounds or Type III open fractures a second look debridement should be done until the soft tissue viability is stable. In places where orthoplastic services are available, and irrigation and debridement are done by experts (orthopedic trauma and plastic surgeons) these fractures can be treated using the fix and flap concept.

Section 4: Discussion (<1000 words)

Is a routine "second-look" debridement at 48 hours mandatory in severe Grade III or crush injuries? Unless an orthplastic service is available and the have experience on management of complex open fractures and are able to apply the fix and flap principle; most people should do and I&D by a senior orthopedic trauma surgeon on the first day and then cover the wound (saline soaked gauzes or NWT) and reassess at 48 hours in order to cover the wound or plan coverage in the next days by an expert plastic surgeon.

Section 5: Risk of bias of included studies

High risk of bias since these injuries are treated in different facilities with very different resources, and the numbers are not enough to have unbiased conclusions.

Section 5: Response/Recommendation (1-2 lines as a conclusion and recommendation statement for the question)

In severe grade III or crush injuries a second look debridement at 48 hours should be mandatory

Section 6: Level/ strength of Evidence:

Low level of evidence, most are case series and done in places with different resources