

Section 8: Bone Graft

Secondary Alveolar Bone Grafting

April 2009

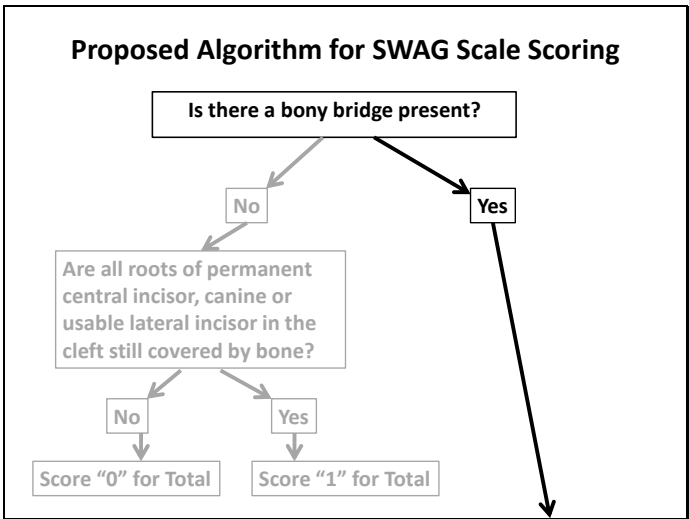
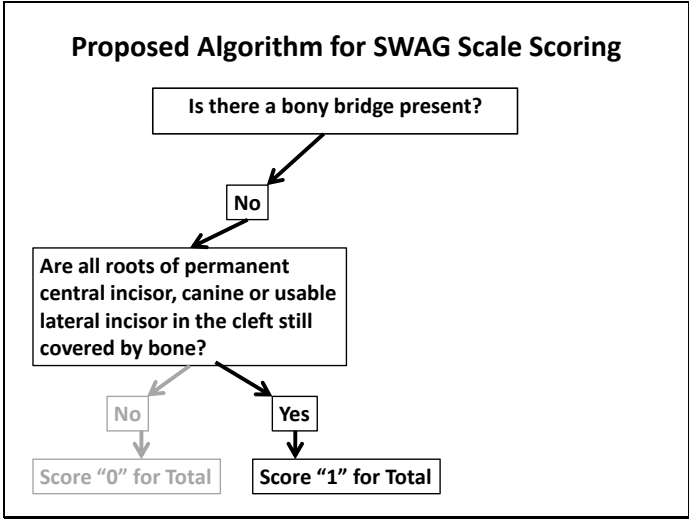
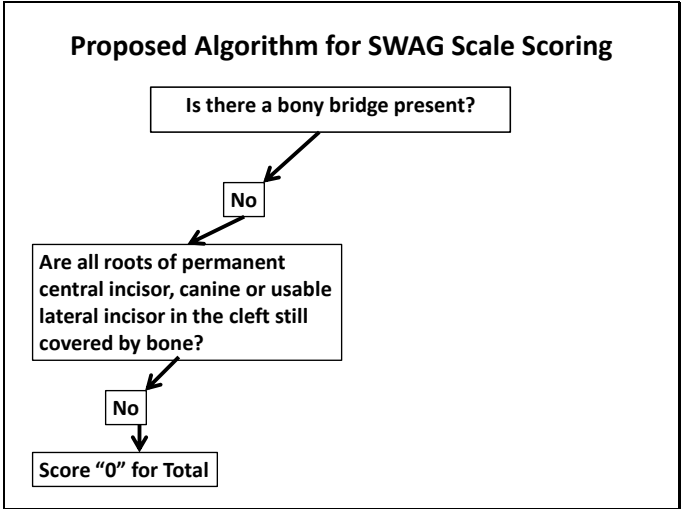
Secondary alveolar bone grafting (ABG) procedures vary between centres for many variables including the type of surgical procedure, the age of the patient, and the donor site. With the significant variation in treatment protocols and the unproven claims of superiority of certain procedures, there is an identified need for a controlled study to evaluate the outcomes of secondary ABG.

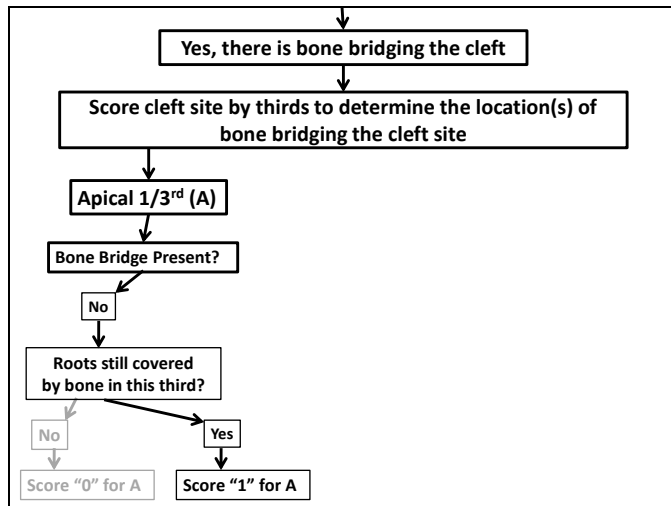
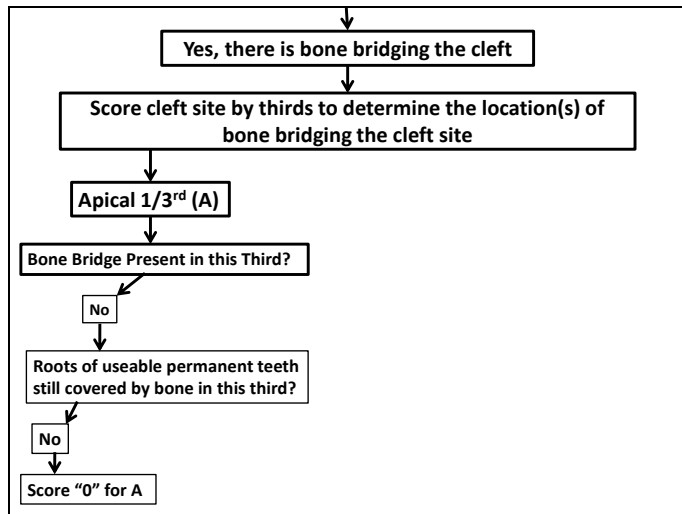
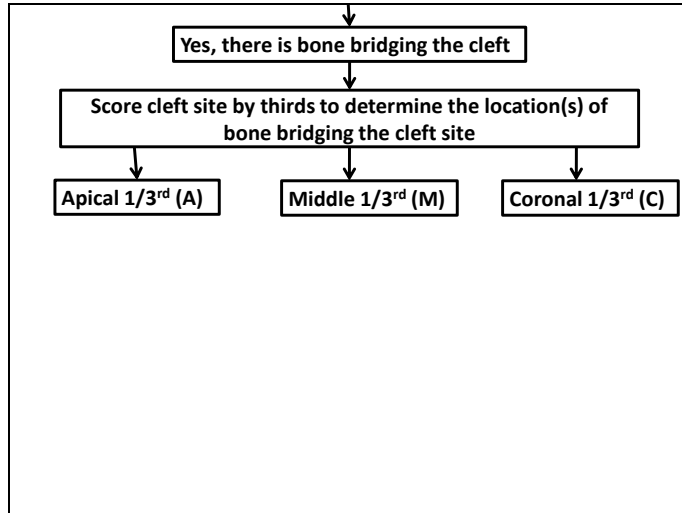
While there are many outcome parameters that are assessed and reported, within the AmeriCleft Study the goal was to have a reliable and reproducible objective outcome analysis that was 'simple' to use and meaningful for the outcome assessments. Factors in the assessment tool that have been considered include: time, a yardstick vs. true measures, and a method that is easy to apply, applicable in the mixed and permanent dentitions, statistically comparable, usable between centres, and appropriate for both retrospective and prospective studies. The possible use of the assessment tool via the internet was also a characteristic of the assessment outcome that was preferable.

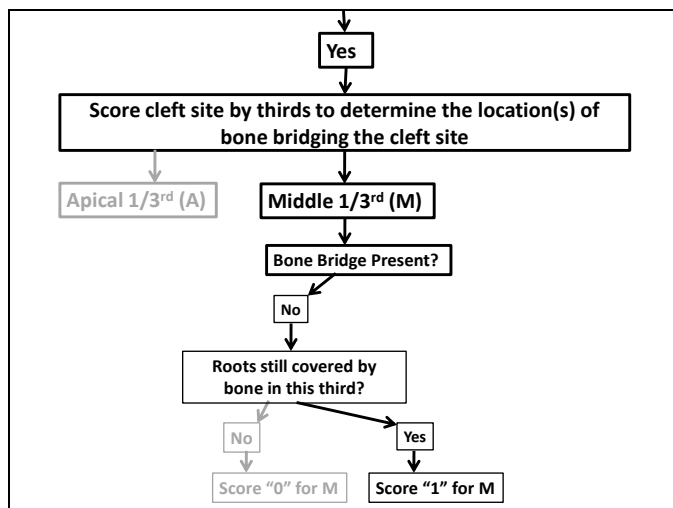
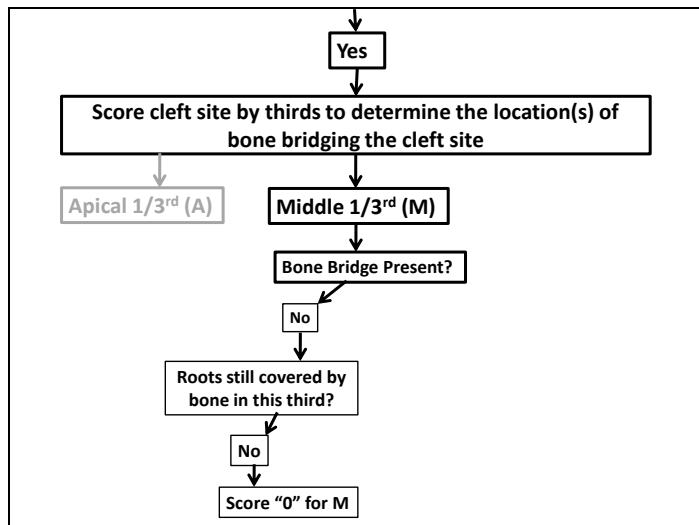
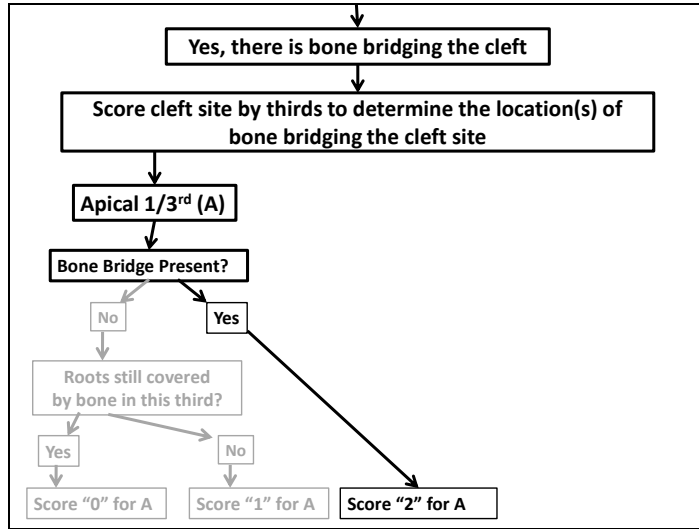
Goals of a successful ABG that the method should capture include closure of vestibular and palatal oral-nasal fistulae, presence of bone for dental eruption, skeletal nasal base, adequate bone for the placement of implants, functional airway, reconstruct bony and muscular / soft tissue architecture. The AmeriCleft group determined that the amount and location of bone was to be assessed within the confines of the inter-radicular space from the CEJ to the apex of the adjacent teeth, including presence of incomplete bony bridging both vertically as well as laterally.

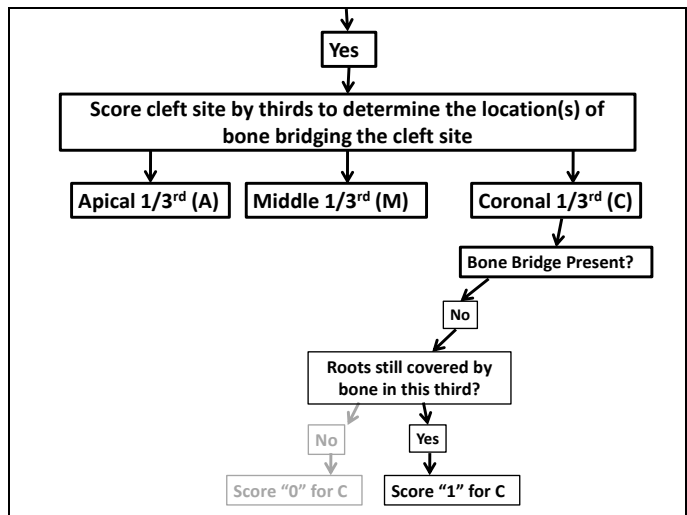
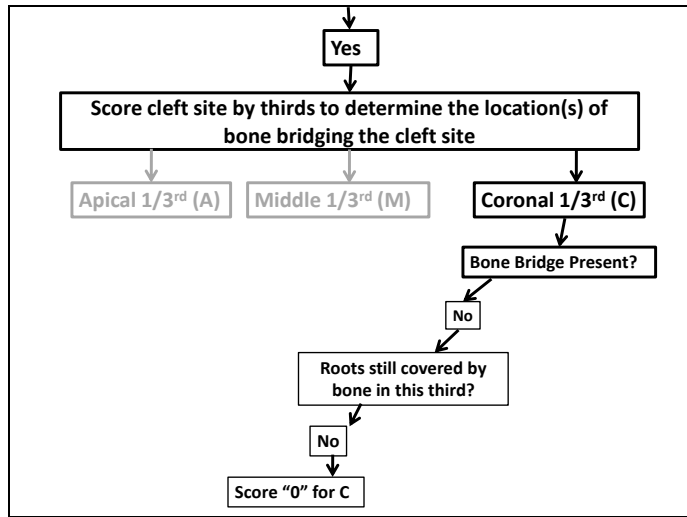
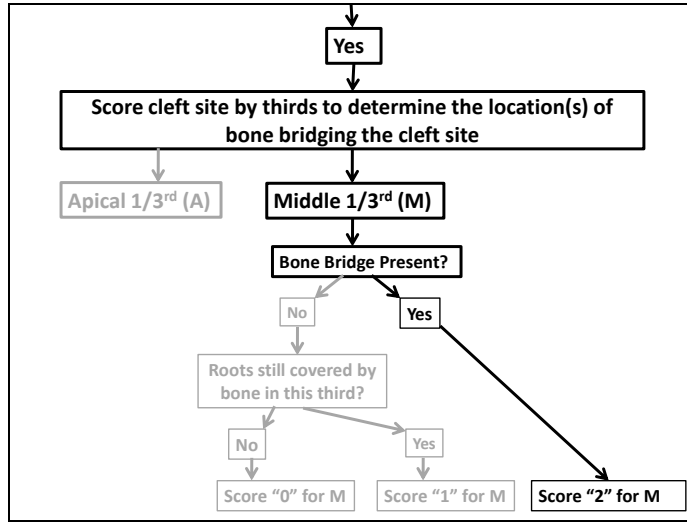
There are many different studies that have reported methods to assess the success of secondary ABG (Bergland 1986, Rosenstein 1997, Nightingale 2003, Kindelan 1997, Hynes 2003, Lilja 2000, Long 1995, Withrow 2002). The AmeriCleft group is proceeding to run a pilot test using the Withrow (Chelsea) Scale. It consists of an 8 point scale that accounts for bony bridging both at the apical and cervical aspects of the cleft site, measures both the amount and location of bone, a visual rating scale that appears to be easily implemented both retrospectively and prospectively and could be used as well via the internet for rating by different centres not required to be in the same location, uses periapical or occlusal radiographs that are routinely taken prior to and after ABG, and the reported Kappas are acceptable. Part of the pilot study for ABG will also include panoramic radiographs to assess the recreation of the nasal floor and the ability to rate this from the radiographs. The possible use of this method retrospectively will also depend on the availability of panoramic radiographs. As a result of these pilot studies, the Americleft Group developed a new scale, A Standardized Way to Assess Grafts (SWAG) which has been published and for which a proposed algorithm for rating grafts is presented below.

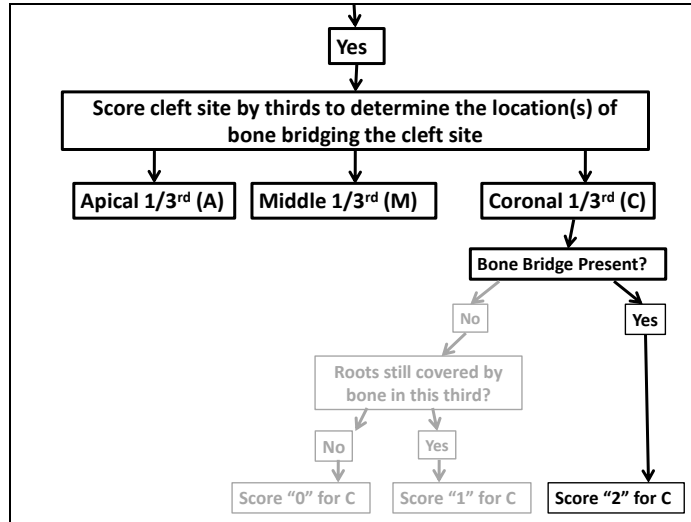
The patient information required to compare the ABG results would be: primary surgical procedures, age at ABG, previous surgical procedures including failed ABG, successful or failed fistula closure, surgical technique used, occurrence of expansion prior to ABG, and the presence of fistula at the time of surgery. Records to be assessed include periapical or occlusal radiographs 3-6 months pre-ABG surgery and at least 3 and preferably at least 6 months post-ABG.











Total Score for grafts with a bony bridge at least 1/3 of total cleft height

$$= A + M + C$$

Consensus Agreement on Difficult Decision Areas

- Consider a “bridge” of bone any uninterrupted, trabeculated span of bone across the cleft site, regardless of size.
- Do not attempt to interpret 3-dimensional configuration from from varying degrees of radiopacity on 2-dimensional films.
- When the bridge(s) fall across thirds, place it in the third(s) in which most of it falls.
- For a lateral incisor to be considered potentially usable, it has to be clearly permanent and with clear indication of adequate root development.
- Only exposed roots, but not crowns, of permanent teeth in failed grafts or unbridged thirds require a “0” score.

PUBLICATIONS

1. Russell KA, Long Jr RE, Daskalogiannakis J, Mercado AM, Hathaway RR, Semb G, Shaw WC. A multi-center study using the SWAG Scale to compare secondary alveolar bone graft outcomes for patients with cleft lip and palate. Cleft Palate-Craniofacial J. 53:180-186, 2016.
2. Russell KA, Long Jr RE, Daskalogiannakis J, Mercado AM, Hathaway RR, Semb G, Shaw WC. Reliability of the SWAG – The standardized way to assess grafts method for alveolar bone grafting in patients with cleft lip and palate. Cleft Palate-Craniofacial Journal, 54:680-686, 2017.
3. Ruppel JK, Long Jr RE, Oliver DR, Semb G, Russell KA, Mercado AM, Daskalogiannakis J, Hathaway RR. The Americleft Project: A two-center comparison of short and long-term secondary alveolar bone graft outcomes with the SWAG scale. Cleft Palate-Craniofacial J., 53:508-515, 2016.

PRESENTATIONS

2011 ACPA San Juan, PR

THE AMERICLEFT PROJECT: MULTICENTER RETROSPECTIVE SECONDARY ALVEOLAR BONE GRAFTING OUTCOME STUDY

Russell, Long, Daskalogiannakis, Mercado, Lamichane, Hathaway, Semb, Shaw

2012 ACPA San Jose, CA

AMERICLEFT – THE SWAG METHOD USED TO ASSESS SECONDARY ALVEOLAR BONE GRAFTS IN THE MIXED AND PERMANENT DENTITIONS AND AID IN FUTURE TREATMENT PLANNING

Russell, Long, Lamichane, Daskalogiannakis, Mercado, Hathaway, Semb, Shaw

THE AMERICLEFT PROJECT: A TWO-CENTER COMPARISON OF SHORT AND LONG TERM OUTCOMES OF ALVEOLAR BONE GRAFTING USING A NEW RATING SCALE

Ruppel, Long, Semb, Hathaway, Mercado, Russell, Lamichane, Daskalogiannakis

2017 ACPA Colorado Springs, CO

COMPARISON OF ALVEOLAR BONE GRAFT OUTCOMES WITH OR WITHOUT THE USE OF CORTICAL BONE GRAFT FOR NASAL FLOOR RECONSTRUCTION IN CLEFT LIP AND PALATE

Doucet, Russell, Kearns, Martyna, Daskalogiannakis, Glick, Beals, Kornbluth, Mercado, Sitzman, Emanuele, Campbell, Hathaway, Long

