

Chapter 30: Surgical Treatment of the Upper Third of the Aging Face

Ferdinand F. Becker, Calvin M. Johnson

In the last few years a great deal of interest has been generated in the surgical treatment of the upper third of the aging face. Before that, only sporadic interest had been shown in this vital area in the aesthetic surgical literature. It is well known that as the face ages the skin loses elasticity, creating redundancy of skin in the neck and jowl areas. Deep and fine wrinkles develop in the cheeks and perioral areas caused by repeated contraction of the mimetic muscles of the face, with loss of the ability of the skin to spring back to its original condition. Blepharochalasis results in fine wrinkling of the eyelid skin, and crow's feet develop lateral to the orbital area. Laxity of the orbital septum causes protrusion of adipose tissue, creating bulges or bagginess in the eyelids. While slightly more resistant, the upper third of the aging face is not immune to this process. Laxity of the skin and soft tissues of the forehead creates deep horizontal rhytids and vertical glabellar frown lines because of the contractions of the frontalis, procerus, and corrugator supercilii muscles against skin that has lost its elasticity. The brows become ptotic, accentuating any redundancy of the skin of the upper eyelids. Ptosis of the forehead and brows often creates a tired, sad, or even angry look, depending on the amount of brow ptosis and glabellar rhytidosis (Fig. 30-1). Although upper and lower eyelid blepharoplasties and cervicofacial rhytidectomies have been done and written about for many years, the surgical treatment of brow and forehead ptosis has been relatively ignored until recently. If blepharoplasty and rhytidectomy only are applied to a patient who has significant brow and forehead ptosis, the aesthetic result will be less than satisfactory.

It is important to understand the normal anatomic position of the eyebrow in order to surgically correct an abnormally positioned one (Fig. 30-2). An excellent description by Rafaty and Brennan (1983) of the "ideal" eyebrow is as follows:

In women, the medial end of the eyebrow should begin at a vertical line drawn through the ala of the nose. The lateral end to the eyebrow should terminate at the oblique line drawn through the ala of the nose and the lateral canthus. The medial and lateral ends of the eyebrow should lie in a horizontal line. The medial end should have a club-head configuration that gradually tapers laterally. The maximum height of the brow should be at the lateral limbus (scleral-pupillary border). The brow should arch above the supraorbital rim. In men, the brow usually lies at the supraorbital rim.

Since the first part of this century many procedures have been described to correct eyebrow and forehead ptosis, and an excellent review of the literature on this subject was carried out by Brennan (1980a). None of these procedures gained much popularity because of the scarring of the forehead that resulted from the direct procedures and the temporary benefits obtained from the limited forehead lift procedures. The revival of the forehead lift was brought about by the recognition of the importance of an extensive dissection of the forehead down over the orbital rims and interrupting the corrugator and frontalis muscles. This evolutionary process was reviewed by Kaye (1977), whose paper on the subject was instrumental in popularizing the procedure in this country.

At the present time there are four available techniques of browplasty that we believe are effective in correcting ptosis of the brows (Fig. 30-3): (1) direct browplasty with an incision of the skin immediately above the brow; (2) midforehead browplasty with an incision in a natural transverse forehead rhytid above the level of the brow; (3) midforehead rhytidectomy with an incision all the way across the forehead in a natural transverse rhytid; and (4) forehead rhytidectomy (coronal lift, forehead lift, frontal lift) with an incision behind the temporofrontal hairline (classical coronal approach) or in the frontal hairline (trichophytic approach) (see Fig. 30-12). Transverse forehead rhytids and glabellar frown lines, along with eyebrow ptosis, may be treated with both the forehead rhytidectomy and the midforehead rhytidectomy. The details of these operative procedures, with emphasis on the key surgical maneuvers, will be discussed and illustrated. The indications, contraindications, advantages, and disadvantages of each procedure will be presented. Much enthusiasm has been created by the renewed popularity of the forehead rhytidectomy because of the possibility of treating all the problems of eyebrow and forehead ptosis in addition to camouflaging the scar totally within the hair-bearing scalp. Particular attention will be directed to this innovative and effective operation.

Direct Browplasty

The direct browplasty or browlift was first described by Passot (1930) and was redescribed with modifications by Castanares (1964). The operation consists of excising an appropriately sized ellipse of skin from just above the eyebrow. Closure of the resultant wound raises the eyebrow and thereby decreases the amount of excess skin of the upper eyelid. Anderson (1972) and Rafaty et al (1975) stressed the importance of suspending the brow permanently by attaching the orbicularis muscle to the fascia of the frontal muscle or periosteum of the frontal bone with nonabsorbable suture material to lend permanency to the ptosis correction (Fig. 30-4, B, C).

Technique (Fig. 30-4)

The face is prepped and draped for a sterile procedure. A marking pen is used to outline an elliptic excision of skin of the forehead with the lower limb of the ellipse being just at the upper brow margin. The amount of skin to be excised is determined by elevating the brow. Some surgeons prefer to do this with the patient in a sitting position. The high point of the elevated brow should be at the lateral limbus, and the ellipse should taper medially and laterally from this point. The local anesthetic of choice is then infiltrated into the skin and muscular layers. We prefer to use a local anesthetic containing epinephrine for its vasoconstrictive effect. After vasoconstriction has occurred, the incision is made at the upper border of the brow. The incision is beveled cephalad to parallel the hair follicles, especially in the medial two thirds. Beveling of the upper incision in the same direction is also done. The skin is excised at the junction of the subcutaneous plane and the orbicularis muscle. Care is taken to avoid going into the muscular layer so that the supraorbital, supratrochlear, and facial nerves are not injured. Permanent undyed sutures are used to suspend the orbicularis muscle to the frontalis fascia or periosteum above to lend permanence to the correction. Three to six sutures are usually used for this suspension. When properly performed, this suspension will often approximate the wound. Symmetric elevation of the eyebrows is critical. A dermal closure is carried out with interrupted sutures, burying the knots. Long-acting temporary or permanent 6-0 monofilament suture may be used for this closure. The brows are always

slightly overcorrected. Blepharoplasty, when indicated, is carried out after the brow procedure has been performed. A more conservative skin excision of the upper eyelids is indicated after browplasty. Antibiotic ointment is used on the wound, and a light dressing is applied.

Discussion

Direct browplasty may be indicated in a patient with brow ptosis of any degree who has soft, nonoily skin that does not have a tendency for hypertrophic scarring, and who does not object to using makeup to camouflage the scar. It is especially effective on patients with sagging of the lateral two thirds of the brows and little or no ptosis or furrowing at the glabella. Direct browplasty is an effective procedure for the correction of unilateral brow ptosis associated with permanent unilateral facial or forehead paralysis from any cause (Fig. 30-5).

The operation is usually contraindicated in any patient with thick, oily Mediterranean-type skin or a history of abnormal scarring, and certainly in any patient who is not willing to accept a facial scar. The procedure may be contraindicated in a patient with an unusually low temporal hairline because the postoperative appearance of the brow located near the temporal hairline could create an unnatural appearance.

The advantages of the direct browplasty are that it is quick and easy to perform, has a very low morbidity, and is considerably less expensive than more elaborate forehead operations. It is very effective, and rarely is there a postoperative recurrence of brow ptosis.

The major disadvantage of direct browplasty is the resulting scarring that may or may not be noticeable and could even require further procedures (dermabrasion or scar revision). The scars may need to be camouflaged with cosmetics and may be made more apparent with sun exposure and its resultant tanning. Elimination of the fine upper brow hairs occasionally results in an unnatural, sharply defined upper brow border that may be unacceptable to the patient.

Since the revival of the forehead rhytidectomy, we rarely use the direct browplasty. It is most often performed on a female patient who does not want to subject herself to the morbidity of the more elaborate forehead lift procedure and is willing to accept a forehead scar. Currently, the procedure is rarely recommended to male patients unless they have smooth, nonwrinkling foreheads or unilateral permanent facial paralysis.

Midforehead Browplasty

The midforehead browplasty approach to browplasty takes advantage of the natural transverse forehead rhytids that are usually abundantly present in men needing brow elevation (Fig. 30-6). By placing the incisions in natural lines, the resulting scars are usually well hidden. Rafaty et al (1978) described their approach to this procedure and reviewed the literature on the subject. Patients must be warned that these scars take several months to mature and they should be fully aware of this before surgery.

Technique (Fig. 30-7)

The face is prepped and draped in a sterile manner. The patient is asked to raise the eyebrows. A natural horizontal forehead rhytid above the brow is then selected on each side and the marking pen is used to mark this line. Usually the first or second wrinkle above the brow is selected, depending upon the amount of skin to be excised. Often rhytids of unequal distance from the brows are selected (Fig. 30-7, A). This can be a decided advantage because the scars, which are of unequal height above the brow, may be less noticeable by the casual observer than scars that are exactly at the same height. Appropriate local anesthetic is injected. After an adequate amount of time for vasoconstriction to occur, the skin is incised along the previously marked line. Dissection is carried out inferiorly at the level of the junction between the subcutaneous tissue and the intrinsic facial musculature. The dissection is carried down to the orbital rim. Care is taken not to go into the frontalis or orbicularis muscle, so as to prevent damage to any of the sensory or motor nerves in the area. Particular care is taken to prevent injury to the supraorbital nerve. The orbicularis muscle is then suspended to the frontalis muscle or periosteum with permanent suture, as in the direct browplasty. Enough excess skin is excised in order for the wound to close without tension. Once again, if indicated, blepharoplasty is always carried out after the brow procedure has been performed.

Discussion

Midforehead browplasty is most often indicated for the male patient with brow ptosis (Fig. 30-8). A female patient who is not a candidate for a forehead rhytidectomy and has deep horizontal forehead creases may occasionally be selected.

Midforehead browplasty is relatively contraindicated in anyone with smooth, nonwrinkled forehead skin, and in most women, except as outlined in the previous paragraph. The operation is contraindicated in patients with histories of abnormal scarring or in patients who cannot accept facial scars.

As with the direct browplasty, the midforehead browplasty has the advantages of being a quick and easy procedure that has rare, minor complications. The procedure is relatively inexpensive compared with the more elaborate forehead procedures and is very effective, with minimal postoperative recurrences.

The major disadvantages of the midforehead browplasty is that, like the direct browplasty, the resulting scar can, on occasion, be noticeable and may require revision or dermabrasion. The patient must be willing to accept the fact that the scar will take several months to mature. However, the scar in a natural forehead rhytid in the male patient is often not noticeable.

Midforehead Rhytidectomy (Midforehead Lift)

The midforehead rhytidectomy was described by Johnson and Waldman (1983). This operation is basically an extension of the midforehead browplasty wherein the incisions above the brows are connected in a natural transverse forehead rhytid. Through this small increase of the incision of the forehead, the entire brow-glabella-forehead complex can be surgically

explored and treated. As with the midforehead browplasty, the midforehead rhytidectomy is carried out most often in men with deep transverse forehead rhytids and occasionally in women in the older age groups with pronounced forehead creases. It is imperative that the incision follow the natural forehead creases precisely, even though it is often asymmetric and slightly irregular. The final scar mimics this crease and must not resemble a surgical scar. The operation is more versatile than the midforehead browplasty because the vertical dimension of the skin excision can be varied. The excision of skin is of uniform width across its length if the glabellar/brow complex is to be raised equally as a unit. It may vary in width in some areas if some areas of the complex are to be elevated more than others. If relatively greater elevation of the glabellar area is desired, the excision of skin will be wider medially than over the lateral brows. As with all operations for brow ptosis, we recommend 0.5 to 1 cm of overcorrection.

Technique (Fig. 30-9)

The patient's face is prepped and draped in the usual manner. The first or second natural horizontal forehead rhytid that goes all the way across the brow is selected, and a marking pen is used to mark where the incision is to be made. The skin and muscle of the entire forehead is injected with an appropriate local anesthetic just as for other procedures. The supraorbital notches are palpated and their locations are marked on the overlying skin. The incision is made through the skin and subcutaneous tissue. The elevation is carried out in the plane between the subcutaneous tissue and the intrinsic musculature of the face as in the previous procedure. The dissection is carried down over the orbital rims in the plane superficial to the musculature. Care is taken to prevent any damage to the supraorbital nerves. If glabellar rhytidosis and ptosis is a significant problem, a transverse incision can be made through the frontalis muscle above the nasal root. This incision does not extend laterally beyond the previously marked supraorbital notches. This muscle flap is dissected in the plane just above the periosteum. The medial limbs of the corrugator muscles are identified and isolated; injury to the supraorbital and supratrochlear nerves and vessels is avoided. A section of the corrugator and procerus muscle may then be excised. The superior flap may be dissected superiorly in the subgaleal plane bilaterally, medial to the supraorbital notches. The central portion of the frontalis muscle and fascia may be incised horizontally as in the coronal forehead rhytidectomy. These incisions are not extended laterally beyond the pupils so as to preserve lateral frontalis function. A segment of frontalis muscle and fascia may be excised and the edges sutured, elevating the glabellar and medial brow tissues. The orbicularis muscles are then suspended superiorly with permanent sutures to the fascia of the frontalis muscle or periosteum as in the previous procedures to ensure permanent correction of the brow ptosis. A small drain may be placed in the incision and brought out through a separate stab incision in the lateral hairline, although this is not usually necessary. The skin incision is closed as previously, with a dermal layer of interrupted sutures with buried knots and a running locking 6-0 monofilament skin suture. A light pressure dressing is applied. If a drain is used, it is removed the following day; the pressure dressing should be light and uniform in order to avoid compression on the skin flaps. In operations done directly on the forehead and brow, sutures are usually removed 3 to 5 days following surgery and supportive tapes are applied for several days more.

Discussion

The midforehead rhytidectomy may be indicated in the male patient with prominent forehead rhytids who has significant ptosis and rhytidosis of the glabellar complex in addition to ptosis of the brows (Fig. 30-10). The coronal forehead lift is most often indicated in female patients and is the preferred operation; however, the midforehead rhytidectomy may be indicated occasionally in an older female patient with deep horizontal forehead rhytids and a high forehead or sparse, thin anterior scalp hair (Fig. 30-11).

Contraindications to the midforehead rhytidectomy are: a history of abnormal scarring; smooth, nonwrinkled forehead skin; markedly sebaceous forehead skin, especially in males; and the patient's inability to accept a facial scar.

The advantages of the midforehead rhytidectomy are that it is a direct approach to the problems of brow ptosis as well as forehead and glabellar ptosis and rhytidosis.

The disadvantages of the midforehead rhytidectomy center around the resulting scar, which can be noticeable and may require revision, dermabrasion, or camouflage with cosmetics. These disadvantages and the fact that the scar will take several months to mature must be discussed with the patient before surgery is performed.

Forehead Rhytidectomy (Coronal Lift)

In recent years, great excitement has been generated in the treatment of eyebrow and forehead ptosis by the revival of the forehead lift procedure using the coronal approach. In the early part of this century a number of approaches to forehead lifting were described involving excision of skin anterior and posterior to the hairline and including excision of musculature as well. An excellent review of the literature on this subject was provided by Brennan (1980b). Unfortunately, the earlier operations were limited, and the results were temporary and ineffective. Subsequently, the importance of galea fasciotomy and frontalis myotomy were recognized as vital steps in the treatment of forehead rhytidosis. The expanded coronal approach to brow and forehead lifting with improvements and modifications has been described and popularized by the reports of Brennan (1980b), Connell (1978), Kaye (1976), Vinas et al (1976), and many others. In addition to interruption of the galea-frontalis complex, it is important in the expanded coronal operation to carry the undermining and dissection down over the supraorbital rims and root of the nose and to the zygomatic arches. Dissection is carried deep to the galea and frontal layers, and therefore damage to the temporal branch of the facial nerve is avoided. This is a deeper plane of dissection than that for the direct brow and midforehead operations previously described. A clear understanding of the anatomy of the temporal branch of the nerve is vital in this operation, and the reader is referred to the work of Liebman et al (1982) and Pitanguy (1966). The surgeon must be cautious to identify and protect the supraorbital nerves and neurovascular bundles as they emerge from the supraorbital foramina. When a facelift is performed with a forehead lift, many surgeons have recommended one continuous incision for the entire operation (Gonzalez-Ulloa (1962) and Kaye (1977)). When both procedures are going to be performed, we prefer to separate the two incisions and operative compartments completely as described by Brennan (1980b) and Ortiz-Monasterio et al (1978) (Fig. 30-12). The frontal operation is performed in the deep subgaleal plane between the galea aponeurotica and the pericranium. The rhytidectomy is carried out

in the more superficial subcutaneous plane of the temple and cheek in order to prevent damage to the underlying frontal branch of the facial nerve. We feel that this important nerve can more easily be protected by separating the two compartments. Also, if a complication were to develop (hematoma or infection), the problem would remain confined to the compartment in which it developed.

Technique (Fig. 30-12)

The patient is prepared by separating the hair from a strip of scalp 1 cm wide, beginning 2 cm above the ear on one side and extending across to the same location on the other side. The part in the hair is located approximately 5 cm posterior to the scalp hairline and parallels the hairline across. The proposed incision is marked approximately 5 cm posterior to the hairline. The hair anterior to the proposed incision is braided. Sedation is provided; the operation can also be performed under general anesthesia. Local anesthetic containing a vasoconstrictor is injected into the scalp along the proposed incision, along the zygomatic arches, supraorbital rims, and root of the nose. Infiltration is carried out in the subgaleal area across the forehead. After allowing an adequate amount of time for vasoconstriction to occur, the incision is made along the previously marked area with a wide surgical blade. The incision is beveled from anterior to posterior to parallel the hair follicles. It is carried through the galeal layer to the pericranium. The flap is dissected in the subgaleal plane with sharp dissecting just superficial to the pericranium and the deep temporalis fascia laterally. When the brows are approached, the dissection is carried down laterally over the orbital rims and medially to the root of the nose. Careful blunt dissection is used to dissect between the lateral orbital rims and the nasal root area until the supraorbital nerves and neurovascular bundles are identified and carefully preserved (Fig. 30-13, D). After the flap has been completely dissected, horizontal relaxing incisions are carried out in the galea and frontalis muscle between the midpupillary lines. These incisions are not carried laterally beyond this point so as to prevent any denervation of the forehead. The corrugator muscles are excised to improve the glabellar frown lines. Hemostasis is secured throughout the procedure with bipolar cautery. The only major vessels that are crossed are the anterior branches of the superficial temporal arteries, which are very carefully and thoroughly cauterized or ligated to prevent hematoma formation. The flap is returned to its original position. Skin-splitting incisions are made and, with upward pull on the flap, excess skin is excised. The amount of upward pull on the medial forehead and brows and the lateral brows is determined by the amount of skin to be removed in each area. If ptosis is more prominent in one area, greater elevation is applied in that area. Several sutures are placed in the galeal layer using permanent or long-acting temporary suture material. The scalp is closed with surgical skin staples. A drain may be placed in the wound before it is closed although this is not ordinarily necessary. A light dressing is usually applied to the forehead and scalp. The brow ptosis is always overcorrected. If blepharoplasty is to be performed at the same time as the forehead lift, it should always follow the forehead lifting procedure.

Discussion

The primary indication for forehead rhytidectomy is significant brow ptosis (Fig. 30-14), and secondary indications are deep transverse forehead creases, lateral hooding (Fig. 30-15), glabellar frown lines, and crow's feet. This operation is primarily performed on female patients. It is occasionally indicated in a younger patient who desires blepharoplasty when

significant brow ptosis is part of the problem (Fig. 30-16).

The primary contraindication to the classical forehead rhytidectomy are a high frontal hairline and thin, sparse anterior hair. This is why forehead rhytidectomies are performed less frequently on male than on female patients.

The advantages of the forehead lift are that the scar is camouflaged behind the hairline, therefore no visible scarring is present. It is an effective operation with long-lasting results and can be used to treat all the problems associated with forehead aging, including glabellar ptosis and rhytidosis.

The disadvantages of the forehead lift are primarily that it is a more extensive operation than other forms of brow lift, with a greater likelihood of complications. However, we have found the complication rate to be extremely low. The operation requires longer operating room time and therefore is more expensive than the more limited brow operations; it also requires more experience and expertise on the part of the surgeon. The operation necessarily raises the frontal hairline, which may be a disadvantage in some patients.

For patients who have a high frontal hairline, the incision can be made 2 mm behind the hairline anteriorly (trichophytic approach) (Fig. 30-17). In this approach, the incision follows the hair line laterally to the temple where it is carried back into the hair-bearing scalp and downward above the ear as in the classical coronal incision (see Fig. 30-12). The plane of this incision behind the anterior hairline is beveled from posterior to anterior, exactly opposite the orientation of the beveling of the classical forehead rhytidectomy incision. This approach allows the hair follicles at the anterior end of the incision to be preserved. As the skin is trimmed at the end of operation, non-hair-bearing skin is sutured to hair-bearing skin. The remaining hair follicles under the anterior end of the incision will grow through the incision over the ensuing months and partially camouflage the incision (Fig. 30-18). After the incision is made, the procedure is carried out exactly as previously described for the classical forehead rhytidectomy operation. When the closure is carried out, careful approximation of the dermis in the frontal area is done with 4-0 Vicryl sutures, and fine 6-0 Prolene sutures are used to close the skin of the anterior hairline. The skin within the scalp is closed with skin staples as in the classical operation. This variation of the operation allows people with high hairlines to be eligible for the operation if they are willing to accept having a visible scar at the anterior hairline. Often patients wear their hair down to cover this area anyway and we have found this to be quite acceptable to most patients. This trichophytic approach has allowed us to expand our indications, and many more patients can enjoy the benefits of this procedure.

Complications

As with any surgery, brow-lifting are not without the risk of complications. Fortunately, infections are quite rare in the facial area because of its excellent blood supply. We have our patients scrub the face, scalp, and neck for several days before surgery with an antibacterial soap in order to decrease the bacterial count of the skin, thereby minimizing the subsequent possibility of infection. Thorough intraoperative hemostasis with bipolar cautery is the best preventive measure. Careful preoperative evaluation will disclose patients with significant hypertension, bleeding problems, and aspirin therapy; these may be dealt with

before surgery. Hematoma is least likely in the direct browplasty in which very little dissection is necessary. The risk increases progressively with midforehead browplasty, midforehead rhytidectomy, and forehead rhytidectomy in that order. Particular care should be taken to control the cut edges of the superficial temporal arteries in forehead rhytidectomy. In direct browplasty, midforehead browplasty, and midforehead rhytidectomy, the dissection is in the plane between the subcutaneous layer and the muscular layer. If this plane is carefully maintained, there will be no damage to the supraorbital or supratrochlear nerves or to the temporal branch of the facial nerve. In the forehead rhytidectomy operation, the dissection is deep to the galeal layer. If this level of dissection is maintained and there is no significant stretch on the flap, there should be no injury to these structures. Numbness posterior to the coronal incision is present because the distal ends of the supraorbital nerves are divided in this incision. However, this does not seem to be of concern to most patients. Rarely, a patient may develop transient hypesthesia or intermittent pain, probably secondary to a needle injury of the nerve. With the direct operations, the patient must be aware that there may be visible scars in the forehead area. However, the scars in the midforehead area are usually camouflaged well in natural skin folds. Pigment changes of the skin have been reported by others, but we have never seen this complication. If the surgical techniques and principles described herein are carefully followed, the possibility of complications should be quite minimal.

Summary

In evaluating a patient for the possibility of facial rejuvenation surgery, attention to and careful evaluation of the aging changes of the upper third of the face is vital. If blepharoplasty and rhytidectomy only are carried out in a patient who has aging changes of the face including significant ptosis of the brows and forehead, the results are likely to be unsatisfactory. Ptosis of the forehead and brows results in a tired, sad look, or even an angry look when there is significant medial brow ptosis and glabellar rhytidosis. In such cases a well-performed blepharoplasty and rhytidectomy can result in improvement. The four operations we use for the treatment of brow and forehead ptosis have been described and illustrated. Two of these procedures (forehead rhytidectomy and midforehead rhytidectomy) can treat forehead and glabellar rhytidosis in addition to brow ptosis. In female patients, we strongly prefer the forehead rhytidectomy or coronal lift for the treatment of brow ptosis and forehead and glabellar rhytidosis. The direct browplasty is rarely performed today although it is still useful for unilateral facial or forehead paralysis and in the female patient with isolated brow ptosis. In males the preferred operation is midforehead browplasty for the treatment of brow ptosis. If there is significant glabellar and medial brow ptosis as well as glabellar rhytidosis, the two incisions for the midforehead browplasty can be connected and a midforehead rhytidectomy performed. The latter operation is rarely performed on a female patient and only if there is significant forehead rhytidosis. In the female with a high frontal hairline, we prefer the trichophytic approach to the forehead lift.

The proper selection and application of the direct browplasty, the midforehead browplasty, the midforehead rhytidectomy, and the forehead rhytidectomy are invaluable to the surgical treatment of an aging face. The above discussion offers some of the finer aspects necessary for a successful result.