

Table 2 predict the incidence of Frontal Sinus CSF Leak

	Number	Eitology	Site	Management	Recurrence and follow up
Roehm et al. ⁸	4 Cases	<ul style="list-style-type: none"> i. Craniotomy ii. Spontaneous iii. Meningoencephalocele, iv. Erosion due to Mucormycosis v. Prior endoscopic sinus surgery 	<p>One case of left frontal ethmoid one case of right frontal and ethmoid Two cases of right frontal and frontal recess.</p>	Endoscopic	<p>-One cases need revision</p> <p>-On year no problem</p>
Bhavana et al. ¹	5 Cases	Traumatic cases		Extra cranial endoscope through the trephine	<p>No recurrence</p> <p>One year follow up</p>
Reyes et al. ⁹	2 Cases	1 [i]Severe trauma gun shot	<p>Right at the ethmoid frontal junction</p> <p>A large posterior table defect in the left frontal sinus.</p>	<p>Endoscopic mangement endoscopic modified Lothrop was performed to expose the Lesion with fat obliteration Frontal recess</p>	Norecurrence
Jones et al. ¹⁰	37 Cases	<p>Spontaneous (13)</p> <p>Tumor (13)</p> <p>Trauma (11).</p>		<p>Endoscopic Mangement</p> <p>14patient hadA Draf III.</p> <p>The nasoseptal flap was used for reconstruction in 27 patients</p>	<p>Success rate on first attempt was 91.9% (34/37)</p> <p>And 97.3% in second attempt endoscopic revision. One patient required a cranialization</p> <p>The average follow-up was 48</p>

Archer et al. ¹¹	43 Cases	<p>Extensive traumatic anterior skull base.</p> <p>Six fractures were classified as Class I, 8 as Class II, and 29 as Class III</p>		<p>All patients were treated with bifrontal craniotomy and received pedicled tissue flaps</p> <p>pericranial flap alone was used in 33 patients (77%). Multiple flaps were used in 10 patients (3 salvage) (28%)—1 with Class II and 9 with Class III fractures</p>	<p>Five (17%) of the 30 patients with Class II or III fractures who received only a single anterior pericranial flap had persistent CSF leak. No CSF leak was found in patients who received multiple flaps.</p> <p>-overall length of follow-up was 14 months</p>
Shi et al. ¹²	15 Cases	<p>4 Defects originated in the frontal recess</p> <p>11 Involved the posterior wall of the frontal sinus</p>		<p>Nine patients has A transnasal endoscopic</p> <p>4 Patients were repaired after widening the frontal recess endoscopically</p> <p>-two patients have combined transfrontal endoscopic approach was used to repair the CSF leak</p>	<p>One patient (7%) required a second repair 1 month after initial surgery and has remained well after 27 months. Complications; 1 case of frontal abscess, 1 case of mucocele.</p>
Becker et al. ¹³	<p>2 Cases</p> <p>Difficult locations</p>	<p>Iatrogenic surgical trauma during craniotomy.</p> <p>Secondary to congenital encephalocele</p>	<p>One leak in superolateral location</p> <p>On leak in the superomedial location</p>	<p>Endoscopic modified Lothrop procedure.</p>	<p>No recurrence</p> <p>At follow-up (27 and 7 months, respectively),</p>

Lee et al. ¹⁴	28 Cases including 9 cases of frontal and frontal recess csf leak	Traumatic (n = 27) - spontaneous (n = 1). 9 cases of frontal sinus and frontal recess		Endoscopic Mangement. The location of CSF leak and direct visualization were significant factors .No postoperative complications were noted	Cerebrospinal fluid leaks from the frontal sinus/recess had a high failure rate (44% [4/9]). Recurrent frontal CSF leaks were successfully salvaged by an open-endoscopic approach. Endoscopic repair was 86% (24/28). The final success rate at second attempt was 93% (26/28)
Freeman et al. ¹⁵	6 Cases patients had CSF and posterior wall fracture of frontal sinus	Traumatic (patients with mild and moderately severe breaches of the posterior wall of their frontal sinus who were managed with intent to preserve the frontal sinus)		Three leaks ceased with temporary external CSF diversion, Two stopped after a single operation bilateral frontal craniotomy subfrontal approach with preserving frontal sinus One patient required two operations	One case (1/3) need revision Surgery.
Virk et al. ⁵	54 Cases including 7 cases of frontal sinus CSF leak	5 Spontaneous 2 Traumatic		Endoscopic Management	On case of failure
Chegini et al. ¹⁶	50 Cases	Truamtic cases criteria (persistent leak of cerebrospinal fluid (CSF) displaced fracture of the posterior wall or - obstruction of the nasofrontal outflow tract)	-	Cranialisation	Four cases of failure(4/50)